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van Kruistum, C.J.; van Steensel, R.

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YOUNG CHILDREN (0-8) AND DIGITAL TECHNOLOGY

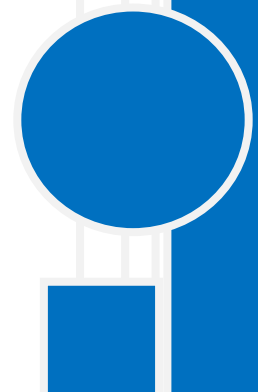
*A qualitative exploratory study - National report -
THE NETHERLANDS*

Claudia van Kruistum
Vrije Universiteit Amsterdam
c.j.van.kruistum@vu.nl

Roel van Steensel
Erasmus Universiteit Rotterdam
vansteensel@fsw.eur.nl

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Executive summary

Key findings

1. One important factor influencing whether and how children use new technologies is their **access** to them at home. The television and tablet are the devices most frequently used across families. In approximately half of the families children own a mobile device. [3.1.1]
2. New technologies fulfill **many purposes**. Young children use them for gaming, connecting with friends and relatives, watching videos and music clips, engaging in school-related activities and sometimes searching for information. Variability exists between families, but also between siblings within families. [3.1.2]
3. Children use digital devices to follow-up on a particular **interest** or as an extension to **regular play**, for example by making video clips of their own songs and putting them on YouTube. [3.1.4]
4. Factors outside of the immediate family environment influence children's engagement with new technologies. Several families are familiar with educational platforms such as Ambrasoft through **school**. To a lesser degree, the **extended family** and **peers** influence children's digital media use, who sometimes expose children to apps or devices not available in the home, for instance Facebook. [3.1.5]
5. Using the tablet and television are among the most popular activities for children to engage in. An important finding is that young children's preference for new technology is generally balanced out by their preference for **non-media play** such as swimming, drawing and outdoor play. [3.2]
6. Parents vary in their support of children's digital media use. Some can be labelled as **advocates** or, at least, **positive suppliers**. Other parents are (explicitly) **negative** and limit their children's media use accordingly. Then there are parents who can be qualified as "**in-betweens**". Notwithstanding, most parents mention both "the bright and the dark side" of digital media. [3.2]
7. The word most frequently associated by parents with new technologies is "**educational**", which is related to the sense generally shared by parents that children benefit from digital media by acquiring skills and knowledge required for school and in their later lives. Furthermore, a slight majority of the parents mention that digital devices stir the children's **imagination**. [3.2]
8. There may be a fine line between positive and **negative aspects** of new technologies. In all but one family at least one of the words "addictive", "distractive" or "tension" is chosen by parents in addition to labels like "educational" and "fun". [3.2]
9. Three types of what we call "**mediation styles**" can be tentatively distinguished: "freedom within boundaries", "striving for balance", "maximizing limits" (see figure). [3.3]
10. Measures parents adopt to **limit** their children's media use involve physical limitations (e.g., using password protection), stimulating or enforcing alternative activities (e.g., outdoor play) and explicit **rules**. Rules apply to four different domains: the acquisition and use of specific content (e.g., not being allowed to download apps); timing (e.g., no television on weekday mornings); the combination of content and timing (e.g., no energizing media activities before bedtime); location or context (e.g., no media during play dates); control

(e.g., having to ask permission to use a device). Some parents **monitor** their children's media use rather than set strict rules. This sometimes results in on-the-spot decisions. [3.3]

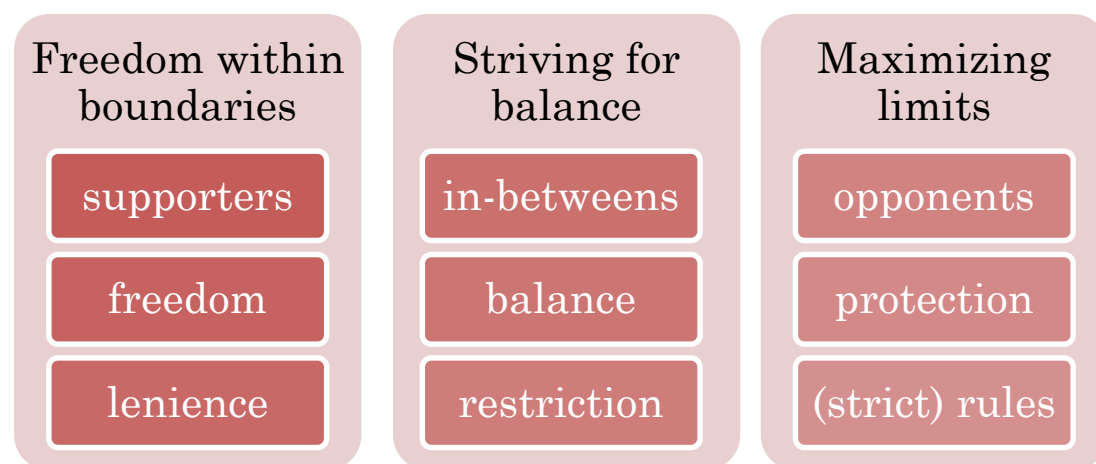


Figure “Mediation styles” adopted by parents

Challenges and recommendations

Recommendations to policy-makers

Policy-makers could help parents in providing them with information on selecting high-quality educational websites or apps and appropriate content, or by enabling children to do so through stimulating media literacy education. Alternatively, they could encourage other actors to do so. [5.2.1]

Recommendations to industries

Industries could accommodate parents' preference for balance by searching for connections between media and non-media play. The challenge is to develop content that is educationally sound, attractive as well as playful, in the sense that it does not require children to “play school”. To develop apps that benefit children's learning and are tailored to the skills levels and needs of individual children, industries are encouraged to seek co-operation with researchers. Also, media suppliers could think further about creating options for parents to protect their children or by highlighting and informing parents about these possibilities. [5.2.2]

Recommendations to parents and carers

Parents are in a unique position to tutor their children's emergent media skills (e.g., technical skills, media knowledge, strategic behaviour, and self-regulation) as well as promote possibly beneficial media practices. Parents are additionally encouraged to be more critical of the use of (free) apps. [5.2.3]

Recommendations to educators

Educators could use examples of children's own, intrinsically motivated media play to use in their teaching, making connections between digital media and learning. Furthermore, the school obviously is one context where even young children can be taught skills and strategies for dealing with the challenges of digital media use. Finally, teachers should be aware of differences between children, so that they are able to differentiate their support of children's media literacy development. [5.2.4]

Acknowledgments

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1. Introduction

Research focusing on the benefits and challenges associated with children's use of the internet has, so far, mainly targeted nine- to sixteen-year-olds (see, for example, the EU Kids Online research carried out since 2006). Yet, research shows that children are going online at an increasingly younger age. However, "young children's lack of technical, critical and social skills may pose [a greater] risk" (Livingstone et al., 2011, p.3). In spite of the substantial increase in usage by very young children, research seems to be lagging behind. Therefore, research that targets children under eight and explores the benefits and risks of their online engagement is imperative.

The present study is conducted to fill this gap in research. It is part of a larger European study that is coordinated and funded by the Joint Research Centre (JRC), the European Commission's in-house science service, and conducted in the framework of the project Empowering Citizens' Rights in Emerging ICT. In collaboration with a selected group of academic partners in different European countries, this qualitative, in-depth study aims at exploring young children and their families' experiences with new technologies. It is a follow-up to a pilot study that was conducted in 2014 in seven European countries (Chaudron, 2015). The results of the present study will serve as a basis for policy recommendations and it will guide larger EU studies into young children's use of new technologies.

This national report presents the findings from the in-depth, qualitative study that was conducted in The Netherlands among ten families with children aged six or seven (labelled the "target child"), their siblings and their parents. Interviews with these families were held in September and October 2015 by the first author of this report and four trained research assistants. The interviews were guided by the following overarching research questions:

- RQ 1: How do children under the age of eight engage with new technologies?
- RQ 2: How are new technologies perceived by the different family members?
- RQ 3: How do parents manage their younger children's use of new technologies? Are their strategies more constructive or restrictive?

While addressing these research questions, the contexts of children's use of new technologies was taken into account, in particular family dynamics (e.g., What do parents and siblings do? What do family members do together?). Furthermore, the larger (social) context was considered, such as the potential influence of extended family, peers and school as well as possible relationships with children's hobbies, interests and non-mediated leisure activities.

Next, portraits are provided of each of the ten families, in which the three research questions are addressed. In section 3 the commonalities and differences between families are highlighted. Then in section 4 more information is given regarding the methodology and in section 5 we conclude with key findings and recommendations.

2. Family Portrait Gallery

Family Achterkamp, NL1

Amsterdam region, The Netherlands

Family members

- Piet, NL1f56
- Annejet, NL1m41
- **Rosalie, NL1g7, grade 3**
- Ingmar, NL1b5, grade 1



Narrative

Rosalie lives with her two parents and younger brother Ingmar in a small, rural town surrounded by meadows. She loves horses, has a friend who owns them and goes to a riding school once a week. Both parents spend a lot of time with their children at home and find this very important. Dad used to own a company that makes technical translations, but no longer works. Mum does administrative work from the home. Furthermore, the children spend a lot of time with their 92-year-old grandmother who lives next-door, their dad's mother. Ingmar did not participate in the interview because, according to mum, he is a bit shy.

There are several digital media devices available to Rosalie in the home, none of which are possessed by her. There is a digital television in the living room, mum owns a laptop and dad a personal computer and a tablet. The children are allowed to use these devices. Remarkably, neither parent owns a smartphone. They feel no need to because they are always home and can be reached by landline telephone or e-mail. Dad has an outdated model of a mobile phone in his car, but almost never uses it.

"It has a chat function, so she can chat with her friend as well. In principle I don't endorse it, but well, it is an online game. (...) Last week I finally found the server her friend was on."

Piet, 56 (NL1f56)

Rosalie and Ingmar are very keen users of particular games, which they mostly play on dad's computer because they are not available on the tablet. Rosalie loves Star Stable, a game that matches her interest in horses. She plays other (horse-related) games as well, but this one is her favorite. In Star Stable the player chooses a horse, trains it and tries to accomplish missions. It also has a multiplayer function, meaning that Rosalie can play together with her friend who also likes horses. Sometimes Rosalie uses the chat function in the game to talk to her friend, mostly about the game. Dad helped her to do so by finding the chat server her friend was on. In the interview he explains: *"It has a chat function, so she can chat with her friend. In principle I don't endorse it, but well, it is an online game. (...) Last week I finally found the server her friend was on."* (NL1f56)

Younger brother Ingmar has a different kind of interest, namely in motorized vehicles such as tractors. He is very fond of the game Farming Simulator, which is a realistic game for adults

that allows players to manage and grow their own farm, for example by cultivating their land and harvesting crops. Ingmar played with the demo version for two years and the day before the interview dad and mum bought him the full version. Ingmar's interest in motorized vehicles seems to reflect a family interest in them. His uncle owns a transport company and his 92-year-old grandmother living next-door uses apps such as Flight Radar and P2000 to see which planes flyover and to track emergency services.

Besides using digital media for playing games, the children frequently watch television. In addition, Rosalie sometimes uses Topomania to look up where a city or country is located and occasionally uses Skype to keep in touch with relatives abroad. However, digital media do not dominate the everyday lives of her and her younger brother. The children spend a lot of time with their parents, for instance by enjoying bedtime stories or board games together and spending time in the garden playing soccer. Rosalie regularly plays with her younger brother, for example with his trucks. Also, there is a train track near their house and one game they play is to guess which train passes by. In addition, Rosalie plays with friends when school is out, among them her horse friend. When asked whether she would prefer playing Star Stable over horse riding in real-life, she did not have to think very hard and chose the latter.

The children's media use reflects their parents' perception of digital media. On the one hand, dad and mum feel digital media are fantastic because they can be fun, educational and stimulating. However, they also do not want to place a lot of emphasis on them. Other things are important as well such as handcrafts, which dad sometimes teaches at school. He also feels digital media can limit the imagination. Furthermore, he thinks it is important parents bring their children back to reality. Star Stable and Farming Simulator are fun, but *"in reality you get hurt when falling off your horse"* and *"crops may be destroyed"*. (NL1f56) Dad especially dislikes games such as Grand Theft Auto: *"It is not normal to drive people to death"*. (NL1f56) Nonetheless, he is a keen and proficient user of digital media himself. He used to rely on them for work, for instance on applications like Google Translate and Photoshop. In addition, he enjoys playing Farming Simulator with his son. Mum uses digital media to play games, browse the web or Skype with her relatives abroad.

The way dad and mum intervene in their children's use of digital media matches their ambivalent perception. On the one hand, they stimulate the children's use of digital media. For example, they saw that Ingmar was no longer challenged by the demo version of Farming Simulator and bought him the full version. In addition, dad helped Rosalie to make use of the chat function in Star Stable so she could talk to her friend. The children also have the freedom to install apps themselves.

On the other hand, mum and dad limit their children's digital media use in several ways. For instance, Rosalie would very much like to become a so-called Star Rider, which would allow her to use more functions of the game Star Stable. However, mum and dad generally do not pay for games. They just spent a lot of money on a horse riding outfit for Rosalie and they want her to learn that there are monetary limits. Furthermore, some content is not allowed in the house. The children are not allowed to play games like Grand Theft Auto and mum and dad removed the television channels Disney XD and Nickelodeon because they themselves consider these poor taste (e.g., they are badly dubbed). In addition, the computer is password protected and the television has a children's lock, meaning that for programs with adult content a code is required. The children do not know the password nor the code. There are also some rules with respect to when digital media can be used: during weekdays not in the mornings and never before bedtime. The latter only applies to activities that energize the children; an activity

such as listening to Spotify before sleep would be allowed. These are especially mum's rules, as dad is generally less strict.

Family Bergmans, NL2

Amsterdam region, The Netherlands

Family members

- Bart, NL2f59
- Annemarie, NL2m44
- **Simon, NL2b7, grade 2**
- Klaas, NL2b5, pre-school



Narrative

Simon lives with his mum, dad, and his younger brother Klaas. Dad is an entrepreneur in the field of advertising. Mum is a teacher in secondary education. The boys often play together, engaging both in media play (Nintendo Wii) and non-media play (e.g., LEGO, playing outside).

The family owns a number of digital devices. Mum has a computer, which she uses for work and is placed in her study. Both parents own a smartphone. The family used to have a tablet, but when it broke down, they decided not to buy a new one. The family owns three television sets: one in the living room, one in the parents' bedroom, and one which the parents placed in the attic especially for Simon and Klaas. The family also has a Wii.

"There comes a time when it [digital media use] is part of their lives, but now we very much keep it under control."

Annemarie, 44 (NL2m44)

The parents differ considerably in their media use. Dad is a frequent smartphone user: he uses it about an hour and a half per day, primarily to send messages for work. Mum, on the other hand, mostly uses her phone during free time and not for work. Dad is also an enthusiastic television viewer, whereas mum hates television. Although usually dad (actively) watches in the morning (especially the news) and in the evenings, the television is mostly on during the day, as a sort of background filler. The parents in general do not watch together, because they have different tastes in programs and because mum prefers other activities, such as reading the newspaper.

Simon's favorite pass-times involve mainly non-media activities, such as playing with LEGO, drawing, playing outside, cycling, swimming, a sport he and his brother do called capoeira (a combination of martial arts, dance, and acrobatics), and exploring nature: he recently joined the boy scouts and he sometimes wanders off with his metal detector. One digital media activity he engages in is playing the Wii (especially the LEGO/Harry Potter and LEGO/Pirates of the Caribbean games), although the frequency is very much dependent on the weather and his parents' approval. Simon indicates he prefers regular play over the Wii, referring to the virtual nature of Wii games: "With the Wii, you only do like this [he moves his thumbs], but you

don't really do it yourself." (NL2b7) Sometimes, Simon uses his mum's smartphone to play games. This occurs mostly on Tuesdays, when the boys have their swimming lessons: when one has to wait for the other, mum gives them her phone to bridge the time. Simon is not allowed to use dad's phone, however. Although the family does not have a tablet anymore (see previously), one anecdote reveals Simon's interest in this device: he describes how, a while ago, he made an iPad out of cardboard, indicating that he would like to have one for the moments when the weather is too bad to play outside. The boys watch television every day, but particularly in the weekends. The duration fluctuates with changes in their preference for doing regular play. Because of parental rules, Simon hardly ever uses digital devices with his friends (see further), although he is allowed to use a tablet when they visit his mum's friend.

The parents hardly ever join in on their children's media play: their involvement is limited to dad checking up on what they are playing on the Wii and sometimes Simon asks dad to look up information on the internet, as he cannot do that himself. The parents do watch television together with the boys. Dad does so especially on Saturday mornings: he usually switches on the television in the parental bedroom and watches together with Simon and Klaas, while mum reads the newspaper. Mum watches Klokhuys together with Simon, an educational television show broadcasted in the early evening.

Simon's overall preference for non-media play seems to reflect his parents' attitudes and regulatory activities towards their children's digital media use. Overall, mum and dad encourage their children to engage in non-media play and consciously limit their use of digital media. The parents do not want new media to play too much of a role in their current lives. As mum puts it: *"There comes a time when it's part of their lives, but now we very much keep it under control."* (NL2m44) For instance, the parents decided not to buy a new tablet after the old one had broken down (see previously), because mum in particular has little affinity with such devices and because of negative previous experiences: mum describes how the boys were constantly fighting over the tablet, the youngest son was usually grumpy after using it, and the tablet more or less absorbed them. As dad puts it: *"They do not know their limits [when using the tablet], so 'the thing' for now won't enter the house."* (NL2f59) Mum adds that she does not see the supposed educational value of digital media, referring to parents using a (tablet) computer to have their children learn new words after school. She describes an anecdote about her adversity to the recent placement of computers in the local public library: when she saw this, she became really angry, because in her view the presence of computers distracts children from their library activities.

The family has some explicit rules regarding the use of digital media. First of all, the children have to ask for permission to watch television and to play with devices such as the Wii or mum's phone. The parents also decide on the time the children can spend using them. The parents are quite strict: if the children do not stop when their parents ask them to or when they fight over the Wii, dad literally 'pulls the plug'. Another strict rule is that they do not use devices when playing with friends. Once, a friend brought his own tablet, but dad forbade the children to use it: *"I found that unhealthy,"* as he puts it. (NL2f59) This rule holds for the family's own house but also when playing at a friend's house: when Simon goes to a friend and his friend wants to play on a tablet or a game computer, Simon is to leave and go home.

Family Hendriks, NL3

Amsterdam region, The Netherlands

Family members

- Patrick, NL3f46
- Willemijn, NL3m35
- **Debby, NL3g7, grade 2**
- Masha, NL3g5, grade 1



Narrative

Debby lives with her mum, dad, and her younger sister Masha. The family recently moved back to the Netherlands after a stay in Hong Kong and are still settling down in their new home. Dad is without a job at the moment and mum works as an account manager. The family frequently engages in joint activities, particularly in the weekends, when they go on outings, to museums, or the forest. The girls very often play together, engaging both in media play (especially on their tablet, see further) and non-media play (pretend play, Playmobil, girl stuff, such as combing each other's hair, painting each other's finger nails, playing outside).

The family owns a number of digital devices. There are two tablets in the house: one is dad's and the other one is mum's, but because she rarely uses it outside the holidays (see further), it is more or less owned by the children at the moment. Sometimes the children use dad's tablet as well, particularly when they are fighting over their own tablet. Dad also has a laptop, but the children do not seem to use it. Mum and dad both have a smartphone.

"We watch what we feel like at that moment ... Anything you want to, you can find on that device [the tablet]."

Willemijn, 35 (NL3m35)

The family owns a television and a Nintendo Wii.

Mum and dad are much alike in their media use. They both make frequent use of their smartphones. Although they both have tablets, they use them relatively infrequently. The nature of their use does differ: whereas dad uses his tablet for business purposes (i.e., making notes), mum mostly uses it when they are on vacation, to read a book or check her e-mail.

The tablet is a prominent part of both children's daily activities: it is their favorite medium and they use it for an estimated 15-20 hours per week. The girls usually use it together, although Debby is mostly in control. Their tablet activities generally start before they go to school: the children are often up early and they are allowed to play with their tablet while their parents stay in bed. In the afternoon, they use it as well, particularly when mum and dad feel the children need to relax after a busy day or week. The children use their tablet for many purposes (although not for gaming). Debby and Masha own a Furby, an electronic robotic toy, which can be connected to the tablet, so that the children can feed it and care for it by means of a mobile app. They also use the tablet for watching videos, particularly animal films (from National Geographic, the Discovery Channel), music clips, amateur videos for children (i.e., clips where Playmobil or My Little Pony figures are used to re-enact certain scenes), and

cartoons (especially a show called Lazytown), all on YouTube. Mum adds that they also use the tablet as an information source: if Debby and Masha have a knowledge question, mum suggests they use the tablet to find an answer. In addition, the children use the tablet to make videos or photos.

Mum describes how, before the family bought a tablet, Debby frequently played with mum's smartphone, which served the same purposes as the tablet does now (watching videos, playing games). These days, the smartphone is not more than a substitute: the children only use it when they cannot use their tablet (e.g., in the car). There is one exception: Debby uses the phone for Facetiming with her old friends in Hong Kong and for WhatsApp (Voice).

The girls regularly use the television, but less frequently and during shorter periods of time than they use their tablet. Mum says that the television is more of a reserve option to the children: when the tablet's battery is low, they watch television. Interestingly, mum describes how they are able to remain focused on a movie much longer when they watch it on their tablet than when they watch it on television. Mum suggests this is because they experience more flexibility when using the tablet: the tablet offers much more choice than regular television does, which gives the girls the freedom to watch what they want when they want it. Paraphrasing the children's thoughts she says: *"We watch what we feel like at that moment ... Anything you want to, you can find on that device [the tablet]."* (NL3m35) Mum adds that the children *"were not raised with the TV"*. (NL3m35) She refers to the Apple TV they owned in Hong Kong during the first four or five years of the children's lives, which offered a similar choice as the tablet does.

Debby also likes the Wii (Masha hardly ever uses it), but, as it seems, she mostly plays with it at her friend Andrea's house. Debby engages in other media play with Andrea as well: she describes how they play a cooking game on Andrea's Gameboy. Dad also refers to the situation in Hong Kong, where Debby and her friends used to make video clips of their own songs with her friends and put them on YouTube. Another context where the children play with digital media outside their homes is at their grandparents': both dad's parents and mum's mother have a tablet.

The parent's involvement in the children's activities on the tablet is limited to mum downloading the apps the children select and mum being present when they are Facetiming with friends from Hong Kong. Otherwise, *"the iPad is their thing,"* as dad puts it. (NL3f46) When they were in Hong Kong, Debby and her parents did play Scula together, a Dutch educational app. The only other media activity the parents engage in is watching television: Debby describes, for instance, how they all watch the children's news together.

Although dad mentions the possibly addictive nature of devices such as tablets, the parents overall have a positive attitude towards digital media. Two of the advantages they mention is that using new media stirs the children's imagination (e.g., they copy things they see in their regular play) as well as their curiosity. Dad describes how their search for information causes a "chain reaction" with searches leading to new searches, resulting in deeper information processing and learning: as an example, dad mentions that the children know a lot about animals through watching YouTube videos. Additionally, mum feels the tablet is a lot less passive medium than the television is. Another advantage is that viewing English content helps the children maintain their English language skills, which the parents find important, because of their stay in Hong Kong. The parents are not very strict with their children's use of digital technologies. According to mum, this is partly caused by the transitional phase the family is in: moving from abroad made the parents more lenient. The general principle the parents have could be described as 'freedom within boundaries'. Dad says they want to give

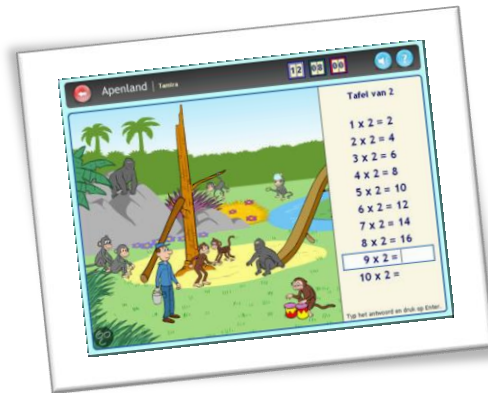
Debby and Masha the opportunity to independently explore devices, but they want to monitor their use as well, that is, they keep watch on the content of their media activities as well as the time they spend. Dad adds that they try to prevent excessive use, by stimulating doing other things and sometimes by explicitly intervening: *“Now and again, I just pull away the iPad”*. (NL3f46) There are two exceptions. First of all, the children are not allowed to use their tablet or watch television when they are having play dates with friends. They also have a rule that smartphones are controlled by the parents, not by the children. Debby is only allowed to use her mum’s smartphone with mum present.

Family Van Dam, NL4

Rotterdam region, The Netherlands

Family members

- Peter, NL4f56
- Josephita, NL4m35
- **Lilou, NL4g6, grade 2**
- Inci, NL4g4, pre-school



Narrative

Lilou lives with her mum, dad, and her younger sister Inci in a suburb near a large city. Mum was born in the Dutch Antilles and works as a counselor and coach. Dad is self-employed and, for unknown reason, he did not participate in the interview. Lilou attends a primary school that provides tablets to children for use at school, starting in the second grade. According to mum, the entire curriculum is offered children to digitally, such as spelling, arithmetic and vocabulary. Consequently, Lilou is exposed to digital media on a daily basis.

In the Van Dam household everyone owns a digital device, including four-year-old Inci. Lilou and her sibling both have a smartphone with access to the internet. Furthermore, Lilou owns a tablet. The children are able to access the internet through wifi only and because this works better on the telephone, Lilou uses it more frequently than the tablet. There are

“When I say you cannot use it for longer than half an hour, I only make it more interesting.”

Josephita, 34 (NL4m37)

also other digital devices present at the home, namely a digital television with dvd player, a personal computer, laptop, MP3 player and a game console (a Wii). In addition, in her own room Lilou has an analogue television set for watching dvd’s. This makes the Van Dam household a media-rich environment to grow up in and, especially in combination with school, offers Lilou with a lot of opportunities to engage with digital media.

Lilou considers using her tablet and smartphone and watching television the most fun activities to do, but does not really use the Wii. Her school days typically start with digital media: before class begins the children are allowed to use the school tablet for playing games. Lilou mostly ends her days with digital media as well, playing with her smartphone before going to sleep. To a great extent the way she uses digital media is influenced by school. For

instance, she indicates herself that she enjoys using Ambrasoft, an online platform developed by an educational publisher that allows children to practice school assignments (e.g., arithmetic and reading) at home. Lilou also regularly downloads apps and watches YouTube clips in which school work is explained. Sometimes when a friend comes over to play they re-enact school at home and involve the tablet in their pretend play, for example by doing pretend arithmetic.

Lilou uses digital media not only for educational purposes, but also for playing games and keeping in touch with friends, family and acquaintances. Among the games she plays are Hay Day, Best Fiends and Farm Heroes. Hay Day is a game for children and adults in which the user takes care of a farm by growing and selling vegetables and taking care of farm animals. Sometimes Lilou plays it together with her mum, each on their own mobile devices. For keeping in touch she uses WhatsApp. At least two of her friends use WhatsApp and she also exchanges messages with her friends' mothers, her grandfather and her dad. For instance, mum indicated that Lilou messages her dad to ask him what time he will be home from work and during the interview she sent a message to her grandfather and received a reply instantly. Using WhatsApp seemed common practice to her. Through her online gaming she is also exposed to another social media platform: she has a Facebook account that mum created for her so she could play Hay Day.

Even though Inci also owns a smartphone, her digital media use is strikingly different from that of her bigger sister. When Lilou got her own smartphone, Inci found it very exciting and wanted a device of her own badly. Then she got one and used it very frequently, but at the time of the interview this was no longer the case. She looks up to her bigger sister, but Lilou does not pay a lot of attention to her and prefers digital media for solitary use.

Lilou's media use is clearly a consequence of her mum's liberal stance towards digital media. Because the children (will) need to use a tablet at school, mum feels it is important they become acquainted with digital devices. She also finds them relaxing, fun and social, and enjoys playing games herself. She does acknowledge negative aspects, such as that digital media can be anti-social when they are used for solitary activity, when *"everybody does their own thing"* and *"has no real contact with another person"*. (NL4m37) She furthermore mentions that *"my mother-in-law would say it is addictive"*. (NL4m37) Yet this is not the prevailing sentiment in her own household.

The way mum intervenes in her children's use of digital media use reflects her liberal stance towards them. There are no explicit rules because mum does not think they are necessary: *"They don't take it too far. They really don't use it the entire day. They also want to play or they go watch television."* (NL4m37) She furthermore indicates that restrictions can backfire: *"When I say <<you cannot use it for longer than half an hour>>, I only make it more interesting."* (NL4m37) Consequently, she deliberately gives her children space and time to use digital devices.

However, mum does keep a tab on her children's use of digital media and there are some ways in which she restricts their usage. Several of her interventions are rather indirect. For instance, she bought a small tablet with a limited range of functions so that it would not be too interesting to her children. In addition, mum mentions it an advantage of the tablet that the battery will run out, thus limiting its usage. Other interventions are more explicit: the children are not allowed to watch television programs or look up content online that are not age-appropriate and they cannot send messages through WhatsApp when it is too late. In addition, whenever mum feels digital media use becomes anti-social she will ask Lilou to come and sit downstairs rather than play in her room alone. Nevertheless, Lilou herself does not

experience any type of restriction: she believes she can use her smartphone and tablet whenever she wants.

Family Mulder, NL5

Amsterdam region, The Netherlands

Family members

- John, NL5f47
- Petra, NL5m47
- **Sophie, NL5g7, grade 2**



Narrative

Sophie lives in a small, rural town with her mum and dad. According to her parents, she is a very active and sporty girl that is fascinated by how things work, for example when dad takes the coffee machine apart. Mum works as a primary school teacher and dad is an employee of a technical department in university. Because of their jobs the parents are often not home at the same time during dinner, which limits the amount of time they can spend together as a family. When they are able to do so, they especially enjoy playing board games together such as Monopoly and Battleship.

One striking feature of the Mulder household is the old, analogue television set in the center of the living room. It functions as a symbol of the parental attitude towards media ownership: *“We don’t follow each hype, because we occasionally see through them. This one will become digital when it breaks down.”* (NL5f47) Consequently,

“Too much is not good. You have to do something with your legs because, well, or else you will become a bit fat.”

Sophie, 7 (NL5g7)

mum and dad have some digital media in the house but do not indulge in gadgets. Besides the analogue television, there is a dvd player in the home, a personal computer and one tablet. Mum and dad each own a smartphone and Sophie owns a music player and a children’s camera. Furthermore, she is allowed to use the family tablet and, occasionally, her mum’s smartphone.

Sophie engages in a large variety of activities: gymnastics, playing with friends, playing board games, playing with LEGO, listening and dancing to music. She also enjoys watching television a lot and uses the tablet to play games and watch movie clips. Generally she uses the tablet moderately, she explains, for instance when she has nothing else to do. *“Because too much is not good. You have to do something with your legs because, well, or else you will become a bit fat.”* (NL5g7) The day before the interview dad installed a new game on the tablet, namely Snakes & Ladders, a classical board game. Because the game is new she cannot stop playing, she admits. Generally speaking, once she starts using the tablet she finds it difficult to stop.

Sophie’s use of digital media is incorporated into several family practices. The games she plays on the tablet are mostly virtual versions of board games she also plays with mum and dad. Mum prefers playing the real board games and dad is more likely to play a virtual version with

her – Sophie enjoys both equally. Furthermore, with her mum Sophie watches a mini drama series on television for children called *The Secret of Oak*. When they have missed it on television, they will watch it on the tablet together. These activities show that some of Sophie's digital media uses are related to other (non-digital) family activities.

They also show that Sophie's use of digital media is largely interest-driven. She enjoys playing particular games (i.e., board games) and watching particular movie clips. For example, she not only watches the *Secret of Oak* but also an educational television series for older children called *Het Klokhuis* that aims to inform children about the world surrounding them. Sophie especially likes reading Donald Duck cartoons and watching them on YouTube. There are other clips she watches and other ways in which she uses digital media. For instance, Sophie uses Skype to keep in touch with relatives abroad and WhatsApp on her mum's smartphone to keep in touch with her grandmother. Furthermore, there are some educational games on the tablet, such as a game that teaches children how to read. Yet of all the things she can do with digital devices, she finds watching Donald Duck clips on the tablet the most fun.

Sophie's moderate use of digital media reflects her parents' use of and perception towards them. Dad has a technical job, is very proficient with digital devices and uses them for a range of functions, for instance to read and write e-mails, to read the news and to look up information. Mum makes use of social media (e.g., Facebook and Pinterest) and enjoys browsing the web to look for recipes. Both think digital media are convenient, useful and even necessary: in modern-day society, children have to learn how to use them. Dad stresses that children need to grow in their use of digital media and makes a comparison with learning how to ride a bike: *"You start practicing in the backyard with the bike and gradually you move towards the street."* (NL5m47) However, they are also very aware of potential risks, for instance that digital media can be addictive. Both mum and dad show themselves self-critical, as they mention that digital media can be addictive for them as well and that they feel tempted to use the tablet as a babysitter, for instance when one parent is doing the cooking and the other parent is not there to entertain Sophie.

In line with dad's philosophy of exposing your child to digital media gradually, Sophie's use of digital media is restricted in several ways. First, she is not exposed or exposed in a limited manner to certain content. For instance, Sophie cannot watch the television channel Disney XD limitlessly because the cartoons tend to be loud and speedy and mum and dad believe children need time to process what they are watching. Also, dad is the one who selects apps to be installed on the tablet. He only installs free apps, he checks which type of data are collected and does not install apps with English texts because Sophie will be unable to read them. Second, she cannot access the tablet on her own: it is password protected and so she has to ask when she can use it. Third, there are some time restrictions, as Sophie can use the tablet for 15-30 mins, according to mum and dad, and watch television for one hour, according to Sophie herself. However, dad mentions that there are exceptions, one of them being that he is less strict. Sophie also experiences time restrictions as generally flexible.

Besides restricting media use, mum and dad feel it is important to monitor media use and to stimulate alternative activities. For instance, Sophie is only allowed to use the tablet in the living room and dad keeps an eye on what she is doing, although he does not watch her constantly. Sophie also mediates her own media use in the sense that she chooses not to see and hear certain things, for instance upsetting news. Sometimes she asks mum or dad to come and sit beside her. In comparison to dad, mum is more inclined to encourage Sophie to switch to a more suitable television program than the one she is watching or to stop watching television altogether and read a book instead.

Family Sneijder, NL6

Amsterdam region, The Netherlands

Family members

- Arjen, NL6f39
- Daphne, NL6m37
- Irene, NL6g9
- **Naomi, NL6g7, grade 2**



Narrative

Naomi lives with her mum, dad, and her older sister Irene. Mum works as a day care educator for four days a week. Dad used to be a reception clerk at a car dealer, but he is without a job at the moment. He stays at home to care for the children. The girls also spend time with their grandmother (dad's mother) and their grandmother and -father (mum's parents). Although the children often play on their own, the family also frequently engages in joint activities, such as going to the woods, the dunes, or the beach (the family lives close to the coast). The two sisters frequently play together, both with and without digital media.

The family owns a number of digital devices, none of which are possessed by Naomi. There is a family laptop, which is used by both girls. Both mum and dad own a smartphone and Irene was given mum's old smartphone. There are two tablets: one is owned by dad, the other, an old one from the toy store, is Irene's. Irene will get a new one for her typing course (see further). The

"Naomi has a vivid imagination, so all the images she sees have a strong impact on her."

Daphne, 37 (NL6m37)

family also owns a Gameboy/DS, a Wii, and an old game computer, which is not in use anymore, because the consoles got lost. The family additionally owns four television sets (one in the living room and one in each of the three bedrooms) and has a dvd player installed in the car. When discussing their media use, mum and dad mainly describe their television use (which is switched on often during the day) and dad's use of the tablet, which mainly involves gaming.

Naomi overall prefers non-media play (playing with dolls, Playmobil and LEGO Friends, fantasy play such as playing school) and handicraft (playdoh modelling), whereas Irene is absorbed by digital media. As mum sometimes tells Irene: *"You get hypnotized as soon as you see moving images."* (NL6m37) Naomi's preference for non-media play is reflected in her skills. Dad compares the two girls: *"When she [Irene] was three, she knew how to use the remote. Naomi still does not know."* (NL6f39) Consequently, Naomi often needs help, also from Irene. Nevertheless, there are some instances where Naomi does engage in digital media use. In the weekends, she uses the family laptop for playing games (particularly girl-like games involving make-up, hairstyling or the 'love test', which she finds herself at a Dutch children games' website called Spelletjes.nl) and for downloading black-and-white pictures she can print out and color. Naomi also takes part in digital media activities her sister initiates. For instance, when Irene takes their dad's tablet to play games, Naomi watches along. Naomi does not start tablet activities on her own, since she is not allowed to use the two tablets very often and they

are stored in a place she cannot reach. At times, she uses the Gameboy, particularly for making pictures. Naomi only uses the Wii when she cannot play outside because of bad weather and there is no alternative.

Naomi also uses digital media outside the home. Together with her sister, she uses her grandparents' tablets, although her grandmother on mum's side (whom they visit more frequently) is more restrictive than her grandmother on dad's side: she urges the children to play outside before she allows them to use the tablet or watch television. Naomi additionally uses a tablet and an iPod when playing at her friends'. The children involve these devices in their play: they play songs, which they then imitate and record.

Irene's digital media use is much more frequent than her sister's. Currently, Irene is following an online typing course for which she daily uses her parents' laptop. She also uses the laptop for searching information and pictures to include in the stories she writes. Additionally, Irene uses the old smartphone mum gave her for playing games and watching YouTube clips. Irene also uses both the Gameboy and the Wii more often than her sister does. In accordance with her more frequent activities, Irene is the more accomplished media user. This is illustrated by an incident in the week before the interview, when Irene (without her parents knowing) posted a photo on her mum's Facebook, even though she had not learned before how to do that: using her digital skills, she inferred which procedure to use.

In addition to these digital media, both children watch television frequently: in the mornings (particularly in the weekends), after lunch on weekdays, and in the evenings. On Friday and Saturday evenings, the children mostly watch popular television shows such as *The Voice of Holland* and *Dance, Dance, Dance* or family movies together with their parents. On weekday afternoons, the television is also on: dad watches the Discovery channel or the news, while the children engage in (non-media) play. During dinner mum and dad watch the television news or talk shows. The children are urged not to watch, because the parents believe it distracts them from eating. During longer car rides the children use the dvd player that is installed in the car. Despite their frequent use, Naomi claims she does not have a real preference for watching television. She judges watching television to be a passive activity (*"You just sit on the couch,"* NL6g7) and: she feels a lack of control: when you watch television, you cannot decide, for instance, which episode of a series you would like to watch. Moreover, her sister often decides which program they are going to watch. Finally, Naomi often listens to cd's, which she has a lot of. Mostly she puts on cd's so that she can dance to the music.

Both parents sometimes join in on their children's use of tablet, laptop, and game computer use. This mostly involves giving help when the children are searching for something. This is particularly the case for Naomi, who has less advanced skills than her sister and gets easily discouraged and frustrated. Dad also provides support during more complex computer games Irene does and he joins in when the children are playing the Wii: especially Irene loves it when she beats her dad.

Although the parents provide many opportunities for usage, they do not explicitly stimulate their children's digital media activities, with the exception of their support of Irene's online typing course. Rather, they regularly try to limit their children's media use, which is particularly true for Irene. Because the parents attach much value to non-media play, they engage their children in other activities (e.g. going to the woods, dunes, beach, see previously), *"to prevent that they get stuck to the computer all the time"*, as mum puts it. (NL6m37) Sometime mum just switches off the television and more or less orders Irene to go outside. Irene is also not allowed to use two devices at the same time, which she has the habit of doing, and the children have to ask permission to use the laptop.

The family also has rules that are meant for protection. The children are not allowed to use mum's smartphone nor go on YouTube or Facebook without permission, because they might see things that scare them. This is especially true for Naomi. Mum adds, "*Naomi has a vivid imagination, so all the images she sees have a strong impact on her.*" (NL6m37) Similar rules apply for Irene's use of her own smartphone. Irene is also not allowed to download games for eight-year-olds and above, because these could be harmful to Naomi. Other rules have a financial background: they are not allowed to print in color that much, because that costs more money than black-and-white printing. The same holds for downloading: Irene can only download freely available games.

Family Staring, NL7

Amsterdam region, The Netherlands

Family members

- Cynthia, NL7m28
- Haylee, NL7g7, grade 2



Narrative

Haylee lives with her mum in a very small, rural town. Their house has a garden that mum designed for Haylee to play in and among other things it features a playhouse and a trampoline. Haylee enjoys playing outdoors with children from her neighborhood, one of whom she calls her 'bff'. She also shares several interests with her mum, such as a love of animals (cats in particular), handicrafts, music, dancing and Spain. Mum is an operating assistant and works long hours, because of which Haylee spends a lot of time at her grandparents' house. She sleeps over each week and considers it her second home.

Digital media devices are available to Haylee at home as well as at her grandparents' place. Haylee owns a music player and a tablet, which she mostly uses at home. Mum owns a tablet, a smartphone and a laptop that does not function properly. At the time of the interview, Haylee's tablet and music player also did not seem to be working. The grandparents recently bought a new laptop, which Haylee uses at their place. Furthermore, she has an MP3 player there and her grandmother owns a smartphone.

"That is just 2015. This is the world. We are about to go only digital. (...) It should not be an issue. (...) It should not be a problem that children are on them [digital media]. They should be able to do their own thing."

Cynthia, 28 (NL7m28)

Haylee's engagement with digital media reflects her interests. She uses her tablet to look up music clips on YouTube that she can listen to and learn new dance moves from. A game she enjoys playing is one in which you can make a photo of your pet and make it look pretty. According to mum, Haylee also has an affinity for educational apps. Sometimes she uses her

tablet to access Scula, a platform for practicing school assignments at home within a game environment. However, even though Haylee finds the tablet very fun, she hardly talks about it. Mum explains that for Haylee the tablet is a next-best option, something she uses when she cannot watch television, when friends are not available to play with or when the weather is too bad for outdoor activities.

The television seems to be Haylee's favorite medium, both at home as well as at her grandparents' place. She watches the music channel Xite and children's programs on Nickelodeon; Spongebob is her favorite cartoon. A special family activity is to stay up late during the weekends and watch Dance, Dance, Dance and The Voice of Holland together with mum. Furthermore, as of recently Haylee spends a lot of time on the laptop at her grandparents' house for school-related activities. She enjoys using Ambrasoft, an online platform developed by an educational publisher that allows children to practice school assignments (e.g., arithmetic and reading) at home. Mum explains that Haylee started doing this because it is used at school on classroom computers from grade 2 and onward.

Although Haylee does not have a smartphone herself, it does play a role in her life. Occasionally she uses mum's phone to play Hay Day, a game she finds rather difficult. The phone also features some Spanish games. According to mum, Haylee stumbled upon a Spanish game by accident one day and liked it so much she wanted it installed on her mum's smartphone. *"She has that very strongly, that she wants to learn that language as well. And then I teach her. She has had that ever since she was very young."* (NL7m28) Spain holds a special place in the family's hearts. When mum was a child, her own parents used to take her there on vacation and now she visits the country with Haylee each year. Mum is currently taking a Spanish language course and sees herself and Haylee living there one day.

Another app on her mum's smartphone that Haylee sometimes uses is WhatsApp, but only when mum is present. She uses it to send messages to her grandmother. She also uses her grandmother's smartphone for sending messages, for instance to the mother of a friend in order to wish them a happy vacation. Furthermore, one of Haylee's friends owns a smartphone that she takes with her outdoors. Because the friend has a mobile phone subscription, she can do anything with it anywhere, something Haylee talks about enthusiastically.

Mum herself is a keen user of the smartphone. It is her walking agenda, as it contains all her work and private appointments (e.g., birthdays). She also uses WhatsApp, Facebook and finds a couple of games addictive, namely Hay Day and Candy Crush. She cannot cope without her smartphone. If she forgets it when she is already on her way to work, she will turn back in order to go get it. The main reasons for this are that she wants school to be able to reach her if something happens to Haylee and that she wants to be able to call emergency services if something happens during her rather long drive to work. Besides her smartphone and the television in the home, mum does not really use digital media. The same applies to Haylee's grandparents, who do not enjoy digital media very much and are not proficient with them, according to mum.

Despite her infrequent use of tablets and computers, mum is generally positive about Haylee's use of these digital media. She feels they are educational, useful, informative and challenging. For example, Haylee recently found a clip on YouTube about the color of feces and told her mum all about it. Mum does mention that the tablet and television can be isolating and distracting: *"Look, she is also rather social by telling things afterwards, but in the moment itself she is watching things really completely in her own world. If you ask her something, you won't get a response because she is so caught up in that story."* (NL7m28)

Because mum feels digital media are important for acquiring necessary skills, she hardly restricts Haylee's use of them: *"That is just 2015. This is the world. We are about to go only digital."* (NL7m28) She feels it is important to give children space: *"It should not be an issue. (...) It should not be a problem that children are on them. They should be able to do their own thing."* (NL7m28) Mum is especially focused on stimulating educational uses, partly because of school. The school does not require children to practice at home with Ambrasoft, but mum does feel that pressure is put on her and the grandparents to provide Haylee with opportunities for engaging with digital media in general and Ambrasoft in particular at home. She needs to be prepared for a digital future and school is already a part of the new world.

There are some exceptions to mum's laissez-faire attitude. Haylee tends to watch a lot of television and in such cases mum turns the device off and asks her to do something else, for instance play outside. Furthermore, mum prefers it if Haylee uses her own tablet instead of mum's smartphone and if she does use the smartphone, mum wants her to use WhatsApp only with her present. In addition, mum has used an option of YouTube to show only age-appropriate clips: *"Just type in <<pussy>> on YouTube. Then you get all sorts of strange clips."* (NL7m28)

Family Driessen, NL8

Rotterdam region, The Netherlands

Family members

- Philip, NL8f45
- Michelle, NL8m42
- **Felicia, NL8g7, grade 2**
- Olivia, NL8g2



Narrative

Felicia lives with her mum, dad and her younger sister Olivia in a suburb near a large city. Dad works in a bookstore. Mum was born in Singapore and works as a manager of a wholesale business. She does not speak Dutch, but understands it. With dad as well as with Felicia and Olivia she speaks English. The family's schedule is quite busy and because of this moments together are relatively scarce and there is no such thing as a typical day. Dad works during the weekends, mum has a busy job and Felicia is involved in several leisure activities such as ballet and horse riding. Moreover, each week the children go to an after-school program and their grandparents' house. Sometimes mum brings them to work with her.

Several digital media devices are available to Felicia in her home. She owns a mini-laptop and a smartphone that used to be her dad's. Also present in the Driessen household are a digital television, a tablet, a game console and a streaming device that allows family members to stream movie clips from mobile devices onto the television.

When asked what she finds the most fun to do, Felicia screams out: "Hay Day!" Hay Day is a game for children and adults in which the user takes care of a farm by growing and selling vegetables and taking care of farm animals. Felicia plays it on her own smartphone. She also uses her phone to send messages to friends and relatives with WhatsApp and Google Hangouts. Because some of her relatives are from Singapore, she sometimes has to use English. Dad and mum estimate that 80% of the time that she uses her smartphone she spends

playing Hay Day and 20% exchanging messages. According to dad, the messages she sends are mostly composed of smileys and strange characters. She also uses the recording function.

Ever since Felicia got her own smartphone, which was a couple of months prior to the interview, she has hardly used the tablet. She thinks this is the case because she has to ask whether she can use the tablet, whereas her phone is hers to use

whenever and wherever she wants. Dad estimates that on a typical day Felicia uses her smartphone for about ten minutes prior to school and thirty minutes prior to going to sleep. She will play with it when the busy schedule allows her to and she is not playing with friends. Throughout the interview, it becomes clear that playing with friends is something Felicia actually enjoys even more than using her smartphone. One of her favorite activities is roleplay, for instance playing that she is a princess. Dad explains that sometimes she involves the smartphone in the (role)play she and her friends engage in. For example, they will enact a play or dance and make a movie clip of this. Digital media also influence Felicia's roleplay in another way: dad notes that she started to re-enact YouTube clips.

Another device Felicia regularly uses is her own mini-laptop, which she sometimes brings with her to her mum's work. However, it is not among the things she likes to do best. Dad installed Ambrasoft for her, an application developed by an educational publisher that allows children to practice school assignments (e.g., arithmetic and reading) at home. According to dad, Felicia's school does not make use of Ambrasoft. Felicia started using it three weeks prior to the interview. Dad explains that she does not use it intensively: she will play educational games for a short amount of time and then switches to watching YouTube clips.

Mum and dad are keen users of digital media themselves, which are mostly glorified televisions for them. Mum enjoys watching Chinese shows and dad Netflix series. Occasionally the tablet is used to Skype with relatives who live abroad. Furthermore, both mum and dad own a smartphone and use it regularly, for instance for Facebook, Scrabble, reading the news and sending messages through WhatsApp. Dad considers themselves dependent on digital media.

Both mum and dad think Felicia's use of digital media is fun, educational and challenging. It challenges her, for example because she has to think about how to spell words in Dutch or in English. Dad illustrates this as follows: *"One day she wanted to find her favorite song. Space, it is called. Well, then she really had to think about how to write Space. And is it English or Dutch? And how do you write it? It has helped her with her linguistic development."* (NL8f45) However, some things are so challenging for her that she will give up on it, dad adds. Ambrasoft is an example of this. *"She thinks it is fun for a little while and then she will think it is too difficult. And she sees – and this is a problem – all digital media primarily as fun. If it isn't fun, she wants to quit."* (NL8f45)

Furthermore, dad explains that digital media stimulate Felicia's curiosity and imagination: *"It might seem as though you are watching something that is prefabricated, something you do not*

"She thinks it [an educational app] is fun for a little while and then she will think it is too difficult. And she sees – and this is a problem – all digital media primarily as fun. If it isn't fun, she wants to quit."

Philip, 45 (NL8f45)

use a lot of imagination with. But you notice, for instance, that when she watches YouTube clips: <<Oh, that is fun, we are going to re-enact that now>>. So the imagination is also stimulated by certain things.” (NL8f45) Yet he also mentions some negative aspects. In particular, he does not like it when Felicia gets up out of bed earlier just to have more time on the smartphone. This shows to him that she is becoming addicted. It also distracts and secludes her from other things going on in her life: “You notice that when she is playing, then she is on the phone, head down. Even when she is watching television she does not hear anything anymore and does not see anything anymore. So she withdraws very much so.” (NL8f45) At the same time he admits that this something they as parents sometimes facilitate when they use digital media as a babysitter, for instance in a restaurant. “It depends on the social circumstances,” he concludes. (NL8f45)

The way mum and dad intervene in Felicia’s use of digital media reflects their attitude towards them. They enable Felicia’s use of them by providing her with devices of her own and installing educational software. Also, they keep a tab on what she is doing by sitting next to her and watching. Consequently, there are no obvious or agreed rules. If they feel Felicia is using her devices for too long, they will ask her to stop. Dad thinks they might have some rules in the future with respect to the smartphone, when Felicia is older and he perhaps no longer knows anymore what she is doing exactly. He also thinks they may need to provide her with more guidance, so she no longer only uses digital media for fun and can benefit more fully from the educational opportunities offered by them.

Family Özgül, NL9

Rotterdam region, The Netherlands

Family members

- Fatma, NL9m39
- Esra, NL9g7, grade 2



Narrative

Esra lives alone with her mum. Her parents are separated. Her mum was born in Turkey and her dad was born in the Netherlands. Esra and her mum only speak Turkish at home. Mum works at the municipality for four days a week, where she reviews requests for financial support of people in need of domestic assistance (e.g., elderly, invalids). Esra still has contact with her dad. He is not present during the interview, so further information on his media use and attitudes is sparse. Mum tries to spend a lot of quality time with Esra, engaging in activities such as shared reading, going to the library, taking walks, going to indoor playgrounds, and going to the park, where mum does sports and Esra plays in the playground.

The family owns a number of digital devices. There is one tablet in the house, which was given to Esra by her dad. Mum does not own a tablet of her own. The family also has a desktop computer, which is placed on the dinner table in the living room. Mum owns a smartphone and Esra owns a simple mobile phone, which can only be used for calls. The family owns one television set, which is located in the living room.

Mum is not very positive about digital media (see further) and indicates she limits her own use of digital technologies in the home as much as possible. Mum only uses a tablet at work and, although there is a tablet in the house, she never uses it herself: it is Esra's possession and mum does not even know its password. Mum does like watching the news on television, but here also she restrains herself from watching too much.

"People become lonely. Because, look, when you come to my house to drink a cup of coffee, then we have social contact. We see each other, we feel each other... That is different from talking to each other through the media."

Fatma, 39 (NL9m39)

Mum indicates that Esra overall makes relatively little use of digital media. Of the media she does use, Esra most enjoys her mum's smartphone, although mum estimates Esra does not spend more than 15 minutes per week using it. Esra uses it for playing games, watching videos, and connecting with her dad, her friends, and her mum's friends through WhatsApp. Sometimes she also uses her cousin's smartphone for playing games. Mum indicates that Esra mostly uses her tablet at school and for homework. Every Friday, she takes her tablet to school, where she uses it to do spelling and arithmetic. Sometimes the teacher also allows her to play games. According to mum, Esra hardly ever uses her tablet for leisure activities at home, although mum later estimates her use at one hour per week. Esra describes how she uses her tablet to watch videos. Esra seems a relatively skilled tablet user: she can download apps, navigate, and open them. Esra uses the desktop computer that is available in the house for homework and, infrequently, for playing games. She also uses a computer when she attends the after-school program. According to mum, Esra's most frequent media activity is watching television. At home Esra watches television in the afternoons on weekdays (though not every day) and on Saturday and Sunday mornings. Mum estimates that on average this amounts to about an hour per week. Esra mostly watches Zappelin, a Dutch television program block for children at the public network. She also watches during the school lunch hour (on the smartboard in the classroom) and when attending the after-school program.

Mum's involvement in Esra's media activities is limited to joint television watching. Additionally, Esra indicates that her dad (not present during the interview) helps her to download apps on her tablet. At her friends' and at her cousin's, Esra does engage in joint new media activities, such as playing smartphone games and playing with the Nintendo Wii, although she also frequently does non-media activities ([outdoor] play, bicycling, drawing).

Mum in principle holds negative attitudes towards digital technologies: she finds them "unhealthy", boring, and a waste of time, and believes these technologies "brainwash" users and lead to social isolation: *"Because if you only talk with people through the media but do not have contact, at a certain point you become isolated. People become lonely. Because, look, when you come to my house to drink a cup of coffee, then we have social contact. We see each other, we feel each other... That is different from talking to each other through the media."* (NL9m39) In fact, she had rather Esra would not use digital media at all. She particularly objects to her using the smartphone. This is reflected in mum's rules and regulatory behavior. Esra can only use mum's phone or her tablet for half an hour at a time and mum stops her when time is over.

Sometimes mum even hides the phone. Later in the interview, mum does add that there are possible advantages of digital media use. For instance, Esra is no regular book reader, but she does read when she is playing with her computer.

Family Van Aalst, NL10

Rotterdam region, The Netherlands

Family members

- Simone, NL10m36
- Sven, NL10b11, grade 5
- **Matthijs, NL10b7a, grade 2**
- Kars, NL10b7b, grade 2



Narrative

Matthijs and his twin brother live with their mum and their older brother Sven. Matthijs' parents are separated; the boys visit their dad every other weekend. Matthijs also has a stepsister, who lives with dad. Mum is without a job at the moment, but she used to be an administrative officer. Dad works as a consultant at a housing cooperative. The twins play more together than they do with Sven, which, according to the boys, has to do with the age difference. Mum and the children engage in both digital media activities (see further) and non-digital media activities together (e.g., she reads to the twins every evening). At the start of the interview, only Matthijs and Sven actively participated. Kars did not want to take part and went upstairs to play with the Wii, which he continued to do when the interviewer went upstairs for the interview with the children.

The family owns several digital devices. There are two tablets in the house: a regular one owned by mum and a smaller one, that was bought for Kars as a learning support tool (subsidized by the municipality). Nevertheless, Sven, Matthijs, and Kars are all allowed to play with each of the two tablets. Mum and Sven both have their own smartphone and there is a third (older) smartphone the boys can use for playing games. Sven also has a Wii in his bedroom, but all three

boys play with it. They also own a DS3 game computer, but this has been missing for a while. Mum has a personal computer, but none of the boys use it, because it has no games installed on it. Finally, there are two television sets in the house: one (a smart TV) in the living room and one in Sven's bedroom. Mum mainly uses her tablet, the smart TV, and her smartphone. She watches movies on Netflix, connects with others on Facebook, and uses her devices to search for information or for online ordering (e.g., theater tickets).

Matthijs uses a tablet daily: on weekdays he usually plays with it for at least an hour after school is out. His total use amounts to about ten hours per week. Matthijs and his brothers use

“Let everyone do their own thing. Of course it isn't healthy if a child doesn't play outside at all, but sometimes you have to leave it as it is.”

Simone, NL10m36

the tablet for watching movies/series on Netflix and for playing (educational) games. Kars also uses his tablet as a learning support tool (see earlier): mum confers with his speech therapist about suitable remedial apps. Every Friday the twins can take the tablet to school, because grades 3 and 4 have initiated a so-called 'iPad morning'. Mum believes the tablet is the boys' favorite device, particularly because of its ease of use; it is considerably less difficult to handle than a desktop computer or a laptop. The boys do not fully agree: they indicate they prefer the Wii, because of the type of games they can play on it. These are more fun than the games on the tablet, because they are more competitive (i.e., they have a levelled structure). The boys play on the Wii about three times a week, both after school and during the weekends. This amounts to an estimated total of about eight hours per week, according to mum. Kars plays more frequently than both Matthijs and Sven do. The smartphones that are present in the house are used by all family members: although they are owned by mum and Sven, Matthijs and Kars sometimes use them as well. Matthijs watches television in the mornings when eating breakfast and after school. Mum estimates he watches for about eight hours per week, although the time he watches, varies: sometimes he sits through a whole movie, sometimes he watches for no more than ten minutes and then goes outside to play.

The only (digital) media activities the children engage in together are Wii play and television watching. Mum regularly joins in on the children's use of the tablet. This first of all involves the family watching Netflix movies together, but mum also helps the children when they do school works on their tablets. The children do not usually use their tablets together: because they have two, they most often sit next to one another, each playing with their own. The boys' stepsister (who lives with their dad, see earlier) also owns a tablet, a Wii, and a smartphone, but the boys indicate they are not allowed to use her devices. The children's grandparents (mum's parents) do not own digital devices such as tablets or game computers. The children have no contact with their grandfather on dad's side.

When asked to judge the value of digital devices, mum is overall positive. She thinks media such as YouTube open up new worlds for children: she mentions an example of her showing the boys some videos of what the world looked like when she was younger. Certain games can also stir children's imagination. Digital media can additionally be used to build in breaks into busy everyday schedules: playing with the tablet is a moment of relaxation for the children after a busy school day and it gives mum some time to do the cooking. She is also positive about the use of devices such as tablets in school: she believes it makes learning more fun and provides children with the skills they will need in the future. She is opposed, however, to educational apps such as Scula: she believes apps such as these only practice test skills, which she thinks is a bad thing. This is why she removed the Scula app from the tablet.

Mum's positive attitude toward digital media seems reflected in her regulation of the children's media use. Most importantly, she has no rule about the maximum amount of the time children can spend using their devices: *"Let everyone do their own thing. Of course it isn't healthy if a child doesn't play outside at all, but sometimes you have to leave it as it is."* (NL10m36) She argues that people who work with computers spend much more time behind screens than children playing on their tablets. She does feel, however, that there is some social pressure not to let children use digital devices too much, which leads her to stress that people should not be too judgmental about other people's pedagogical decisions regarding children's media use: *"Let everyone decide for themselves. If other parents think that half an hour a day on the iPad or the game console is enough, then they should do that."* (NL10m36) Interestingly, Sven and Matthijs are concerned about Kars spending too much time playing on the Wii; they think it is bad for his eyes.

Despite mum's leniency towards her children's media use, she does have some rules: no devices are allowed during mealtime (with the exception of breakfast, see earlier), the devices are not to be taken outside (with the exception of Sven's smartphone), and the children have to be careful not to break them. The twins do not mention any rules, which seems to reflect mum's laissez-faire attitude. Sven mentions two rules: when he invites Facebook friends, these have to be known to mum and he is not allowed to download apps on the tablet by himself.

3. Findings

3.1 How do children under the age of eight engage with new technologies?

3.1.1 Opportunities for using digital devices

One important factor influencing whether and how children use new technologies is their access to them at home. In Table 3.1 an overview is presented of the devices that were available to the children at home as reported by their parents, who were asked to make a distinction between presence at home, whether the device is actually used by the target child and whether it is owned by the child. The table is ordered according to the devices most frequently used by children and shows that the television (either digital or analogue) is the device most frequently used across families, followed by the digital television and the tablet.

In a slight majority of the families that were interviewed none of the digital devices were in the target children's possession. Instead, they were either considered "family devices" or the devices were in the parents' possession and children were allowed to use them. In four families the target child did own a mobile device, which was either a mobile phone, smartphone, tablet, laptop, portable game console, iPod or a combination of these devices. The largest discrepancy that was observed between media usage and ownership existed for the television, followed by the tablet. As Table 3.1 shows, a tablet was present in eight households but only two of the target children owned one.

Table 3.1 Number of families mentioning availability of devices at home

	Used by child	Owned by child	Present at home
Television	10	2	10
Digital television	8	1	8
Tablet	8	2	9
Smartphone	8	2	8
Laptop	6	1	7
Personal computer	5	1	7
Music player/MP3 player/iPod	5	4	6
Mobile phone	5	1	7
Game console for television	5	2	6
Dvd player / Blu-ray player	4	0	6
Portable game console	2	2	2

The interviews revealed that children's ownership came about in different ways. On some occasions technology was bought for the child. In the family Staring (NL7), for example, there were two tablets present at the time of the interview. Haylee (NL7g7) used to make use of her mum's tablet, but when she was about five years old her mum bought a new one for her. It was the season of Sinterklaas, a Dutch feast, and mum and the grandparents decided it was a suitable time to buy Haylee her own device, as she was no longer challenged by the children's laptop she used and started to develop an interest in reading and writing. On other occasions, children were handed devices that used to belong to a parent. There were also some instances in which it was not really clear who owned what. For instance, in the family Hendriks (NL3) the parents indicated that one tablet was mum's and the other was dad's, yet they also mentioned that because mum rarely used the tablet outside the holidays, it was more or less owned by the children at the time of the interview.

Opportunities to use a device obviously depend on whether it is available in the home, but there are other circumstances that either enable or limit children's engagement with new technologies as well. First, parents generally considered the smartphone their private property, certainly not to be used by the child unsupervised, but tended to allow their child to use it in certain contexts or circumstances. Examples of such contexts and circumstances are: to kill time when there are no alternative activities, for instance while waiting at the swimming pool for a sibling's lesson to be over; to function as a babysitter, for instance while eating out; and to use apps that are not available to the child otherwise, mainly WhatsApp.

Second, children's use of digital devices often depends on the availability of alternatives. For example, several children indicated that they preferred regular play over using new technologies such as tablets, but would use those new technologies when their preferred options for spending time were unavailable. Whether or not those preferred options are available can depend on a number of circumstances, a prominent one being the weather. Also, in a number of families the children had a clear preference for one device while other devices were seen as "substitutes" when the preferred device was not available. In the family Hendriks, for instance, where the tablet took a very prominent place, Debby (NL3g7) and Masha (NL3g5) only watched regular television when the tablet's battery was low or they used their mum's smartphone only when they were in the car and could not take their tablet with them. In contrast, in the family Staring the tablet was the next-best option for Haylee (NL7g7), a device she used when she could not watch television, for instance. How attractive a particular activity or device is compared to alternative options can also fluctuate. For example, Sophie (NL5g7) said that her dad had installed a new game on the tablet the day before the interview and that, as a consequence, she used the tablet more. Many parents mentioned that their children's usage of devices temporarily intensifies when a particular game or device has just been bought. Often their increased interest gradually wanes. For instance, Inci's (NL4g4) dad indicated that she found her smartphone very interesting when she had just got it, but at the time of the interview this was no longer the case.

Third, when and how long digital devices are used often depends on the time of week, specifically the available leisure time. Especially in the weekends parents are more lenient. For example, in the family Sneijder (NL6) as well as the family Staring (NL7) parents indicated that a special family activity was to stay up late on Fridays and Saturdays to watch *Dance, Dance, Dance* and *The Voice of Holland* together with their children, as they did not have to get up early the next day. Similarly, in the family Van Aalst mum explained that her boys Sven (NL10b11), Matthijs (NL10b7a) and Kars (NL10b7b) spent more time on the Wii during the weekends.

3.1.2 Digital practices within the family

New technologies such as tablets, smartphones and, to a lesser extent laptops and personal computers, seem to fulfill many purposes. Children and parents use them for gaming, connecting with friends and relatives, watching videos and music clips, engaging in school- or work-related activities and searching for information. The children that were interviewed differed in the range of possibilities they used. This variability was observed between families, but also between siblings within families. For example, in the family Sneijder (NL6) a range of digital devices was available to the children. Irene (NL6g9) appeared to be a keen user of them, but her younger sister Naomi (NL6g7) preferred playing with dolls, Playmobil and LEGO Friends instead. According to dad, this difference between the two girls was already present when they were much younger: *"When she [Irene] was three, she knew how to use the*

remote. Naomi still does not know." (NL6f39) This seems to suggest that children can have different affinities and therefore gravitate towards different types of activities or devices, even when they are raised in the same home (also see section 3.1.4).

As indicated previously, variability is also observable between families. For example, in the majority of the households (see Table 3.1) a game console was present. However, in some families this device was referred to with more enthusiasm than in others. In two interviews The Nintendo Wii featured prominently as a topic of conversation. In the family Bergmans (NL2), Simon (NL2b7) and Klaas (NL2b5) mentioned enjoying playing LEGO/Harry Potter and LEGO/Pirates of the Caribbean. Similarly, in family Van Aalst (NL10) Sven (NL10b11), Matthijs (NL10b7a)



Figure 3.1 Wii games in NL10

and Kars (NL107b) indicated that they preferred the Wii over the tablet because they enjoyed the kinds of games on it better, as these are more competitive (see Figure 3.1). In other families where a Wii was present, the children used it only (very) infrequently. Interestingly, the former two cases involved all-boys households, whereas in the latter families there were only girls. However, this does not mean that these girls did not enjoy gaming. The children in our sample who did not gravitate towards game consoles did often mention to enjoy playing games on other devices, particularly the tablet but occasionally another device such as the smartphone or personal computer. Which device was preferred was, according to several children, related to the availability of preferred games. For instance, in the family Achterkamp (NL1) Rosalie (NL1g7) and Ingmar (NL1b5) preferred the personal computer because their favorite games Star Stable and Farming Simulator were installed on it. Preferences for particular technologies were, however, not only related to preferences for particular games, but also to children's general interests and family practices (see section 3.1.4), and the way parents managed their children's use of technologies (see section 3.3).

Interestingly, in some families both parents and children primarily conceive of the use of digital devices as a solitary activity (also see section 3.2). In the parents' responses this was reflected in their choice of words. Regularly they talked about digital media use as "doing your own thing": "...everybody does their own thing" (NL4m37), "They should be able to do their own thing" (NL7m28), "Let everyone do their own thing" (NL10m36). For example, in the family Van Dam (NL4) digital devices such as the tablet and smartphone were mostly used by the children for solitary play. Lilou (NL4g6) and Inci (NL4g4) both owned their own smartphone and hardly engaged in joint play, primarily because Lilou did not like playing with her younger sister. Yet in other families it is more customary for children to share digital devices. In the family Hendriks (NL3), for instance, Debby (NL3g7) and Masha (NL3g5) typically used their mum's tablet together. In addition, in some families parents (occasionally) join in on their children's technology use. In the family Sneijder (NL86), for example, mum and dad indicated they sometimes helped their children, Naomi (NL6g7) more than Irene (NL6g69), to search for information online. And in several families the parents joined in on their children's games. In the family Mulder (NL5) dad regularly played virtual board games with Sophie (NL5g7), in the family Achterkamp (NL1) dad sometimes played Farming Simulator together with Ingmar

(NL1b5), and in the family Hendriks (NL3) mum and dad played Scula together with Debby (NL3g7). Generally, the most frequent joint parent-child media activity is watching television.

3.1.3 Educational and social uses

Digital technologies such as tablets are most often used by young children for gaming and watching videos and clips for entertainment purposes (see 3.1.2). Other popular uses of new technologies include social and informational/educational uses. In most families, the target children made use of either the television or newer digital devices for informational or educational purposes. For instance, some children watched educational television programs or the children's news. Furthermore, parents and children frequently mentioned the use of educational apps or software such as Scula and Ambrasoft. Both are platforms developed by educational publishers for practicing school assignments at home, for example arithmetic and language. In most but not in all cases the target children became acquainted with these platforms through school (see section 3.1.5 for more information regarding the role of school). Other less frequently mentioned educational activities include the use of Topomania for looking up where a city or country is located, using the tablet to learn a language (e.g., Dutch or a foreign language such as English or Spanish), watching YouTube clips in which school assignments are explained, using the tablet as a learning support tool, and using a search machine to look for information (mostly together with parents).



Figure 3.2 The recording function in WhatsApp

Several children use digital devices for connecting with known others. This occurred in several ways. Most often, children used WhatsApp to keep in touch with relatives, friends and their friends' parents. At the age of six or seven, Dutch children typically attend grade 2 and have had formal education in reading and writing for at least one year. Nevertheless, in the interviews most parents and children indicated that the recording function of WhatsApp was used to exchange messages (see Figure 3.2) and not the writing function. For example, Felicia (NL8g7) owned a smartphone and used it, according to her dad, 20% of the time that she engaged with the device to exchange messages through WhatsApp. When she did not use the recording function, she used a lot of smileys and "strange characters" in her messages instead. It seems that the six- and seven-year-olds in our sample still struggle with composing written messages. Moreover, new technologies make it easier for them to rely on different modalities instead (in this case spoken language). In line with a preference for the spoken modality, some children indicated using Facetime or Skype for keeping in touch, typically with relatives living abroad, which mostly occurred under the supervision of parents.

In one of the interviews the parents mentioned that their child used the chat function within a game. Rosalie (NL1G7) had a passion for horses and, consequently, enjoyed playing the game Star Stable. In Star Stable the player chooses a horse, trains it and tries to accomplish missions. It also has a multiplayer function, meaning that Rosalie could play together with her friend who also likes horses. Sometimes Rosalie used the chat function in the game to talk to her friend, mostly about the game. Her dad had helped her to do so by finding the chat server

her friend was on. In the interview he explained: *“It has a chat function, so she can chat with her friend. In principle I don’t endorse it, but well, it is an online game. (...) Last week I finally found the server her friend was on.”* (NL1f56) Interestingly, he was very much aware of risks potentially involved in the use of digital media. For instance, prior to the interview he had indicated that he did not want Rosalie to be filmed for reasons of privacy. He was also aware of potential risks involved with chatting online, but allowed it because Rosalie only talked with her friend, and only talked about game-related topics. He did not feel it was an issue yet at this age (also see section 3.3).

Furthermore, being active on Facebook also seems to be an exception rather than a rule for young children. Only one target child, Lilou (NL4g6), mentioned having a Facebook account, but she used it for gaming rather than for social purposes. Her mum set up the account for her and Lilou did not use it actively herself. Some children did confide with the interviewer that they had access to Facebook indirectly. These children had friends with Facebook accounts who brought their mobile devices with them when playing outside. This information was not mentioned in the family portraits because in those instances parents did not seem to be aware of this.

3.1.4 Relationships with interests and regular play

Children’s affinities seem to affect the kinds of activities they engage in through digital media. First, several target children used a digital device to follow-up on a particular interest. As mentioned before, Rosalie (NL1g7) was passionate about horses and preferred playing horse-related games. Also, Simon (NL2b7) and Klaas (NL2b5) extended their LEGO play with LEGO games on the Ninento Wii; Debby (NL3g7) and Masha (NL3g5) were fond of animals and enjoyed watching YouTube clips with animals; and Haylee (NLg7) loved cats and learning, because of which she enjoyed educational apps as well as games that allow you to photograph your pet and make it look pretty. There were more examples in the interviews and they show that children’s uses of digital media are often connected to other domains of their life.

A special case of interest-driven media engagement is that children’s digital media use is sometimes influenced by family practices, i.e., the interests different family members hold and the activities they prefer to engage in. For example, playing board games was a popular activity in the family Mulder (NL5). Consequently, the games Sophie (NL5g7) played on the tablet were mostly virtual versions of games such as Battleship. In the family Van Dam (NL4) mum created a Facebook account for Lilou (NL4g6) so that she could play the game Hay Day, just like her mum. Sometimes Lilou (NL4g6) played Hay Day together with her mum, each on their own devices. And in the family Staring (NL7) the family’s love of Spain stimulated Haylee (NL7g7) to engage in Spanish-language apps. A very interesting example of family interests influencing engagement with new technologies was observable in the family Achterkamp (NL1). There seemed to be a family interest in motorized vehicles. Ingmar’s (NL1b5) uncle owned a transport company and his 92-year-old grandmother living next-door used apps such as Flight Radar and P2000 to see which planes fly over and to track emergency services. Ingmar’s dad installed these apps for her and seemed to share this interest. Furthermore, Ingmar and his older sister Rosalie (NL1g7) sometimes played a game in which they had to guess which train passed their house. The fact that Ingmar enjoyed playing the game Farming Simulator, which features tractors, seemed in line with this family interest (although, when probed about this, dad did not really see a connection himself).

Engagement in new technologies is not only often connected to a particular interest. In some cases, children incorporate them in their regular play. For example, when living in Hong Kong Debby (NL3g7) and Masha (NL3g5) used to make video clips of their own songs with their friends and put them on YouTube. They also sometimes watched amateur videos on the tablet featuring children who used Playmobil and My Little Pony figures to re-enact scenes. Furthermore, Lilou (NL4g6) and her friends involved the tablet in their pretend play, for example by doing “pretend arithmetic”. And Felicia (NL8g7) and her friends occasionally enacted a play or dance and made a movie clip of this. Felicia had also started to re-enact YouTube clips. Her dad explained that in this manner, digital media stimulated Felicia’s curiosity and imagination: *“It might seem as though you are watching something that is prefabricated, something you do not use a lot of imagination with. But you notice, for instance, that when she watches YouTube clips: <<Oh, that is fun, we are going to re-enact that now>>. So the imagination is also stimulated by certain things.”* (NL8f45)

3.1.5 Influences outside of the family

Several parents and children indicated that there were factors outside of the immediate family environment that influenced children’s engagement with new technologies. The single most influential one was school. In one family (i.e., the family Van Dam, NL4) the children attended a so-called “iPad school”, where most learning activities are provided by means of tablets, starting in the second grade. Interestingly, this family had a very rich home media environment, where even the youngest child Inci (NL4g4) owned a smartphone with internet access. The target child Lilou (NL4g6) explained how the way she used digital technologies was influenced to a great extent by school. For instance, she indicated that she enjoyed using Ambrasoft, an online platform developed by an educational publisher that allows children to practice school assignments (e.g., arithmetic and reading) at home (see Figure 3.3). Lilou also regularly downloaded apps and watched YouTube clips in which school work was explained. And, as explained in section 3.1.4, sometimes when a friend came over to play they re-enacted school at home and involved the tablet in their pretend-play, for example by doing pretend arithmetic.



Figure 3.3 School assignments in Ambrasoft

Lilou also regularly downloaded apps and watched YouTube clips in which school work was explained. And, as explained in section 3.1.4, sometimes when a friend came over to play they re-enacted school at home and involved the tablet in their pretend-play, for example by doing pretend arithmetic.

In most schools, however, digital technologies do not dominate classroom practice and are used as a complement to learning through print materials. In these schools personal computers instead of tablets are available to children; sometimes a couple of them are located in the children’s classrooms, whereas in other schools the children occasionally visit a room dedicated to ICT. In some families the parents indicated children were allowed to bring their own device to school at fixed times of the week. For example, in the family Van Aalst (NL10) mum

explained that her children's school had one "iPad morning" per week, during which the children were allowed to bring their own tablet.

In case schools employ digital devices as a supplement to print materials, children are familiar with educational platforms such as Ambrasoft as well and some parents provide them with the opportunity to practice at home. For instance, in the family Staring (NL7) mum and the grandparents were focused on stimulating the educational use of digital technologies to some extent because of school. The school did not require children to practice at home with Ambrasoft, but mum did experience pressure to provide Haylee (NL7g7) with opportunities for engaging with digital media in general and Ambrasoft in particular at home. However, school is not the only force driving parents and children to make educational use of new technologies. For example, in Haylee's (NL7g7) case mum indicated that her daughter had an affinity with learning (also see section 3.1.4), even as a young child, and that this was another reason mum stimulated educational uses, particularly with regard to her becoming acquainted with Spanish, a language that has a special value for the family: *"She has that very strongly, that she wants to learn that language as well. And then I teach her. She has had that ever since she was very young."* (NL7m28) And in the family Driessen (NL8), dad had installed Ambrasoft on Felicia's (NL8g7) mini-laptop, but she did not use the platform at school.

With the exception of school, other factors outside of the family that influence children's digital media use are very varied. In some families the extended family plays a role. For instance, in the families Achterkamp (NL1) and Staring (NL7) the children spent a lot of time at their grandparents' place. In both cases the grandparents influenced, at least to some extent, whether and how children used technologies. For instance, Haylee's (NL7g7) grandparents had bought a new laptop, which she used to do school assignments. In her own home no (properly working) laptop or computer was available for her to use. Mum indicated that because the grandparents played such a large role in Haylee's life, she regularly talked with them about how to manage the child's use of technologies. When Haylee got her own tablet for Sinterklaas (see section 3.1.1), this was something mum had discussed with the grandparents as well.

Peers, too, influence what children do with technologies. This way, children sometimes become acquainted with apps or devices they do not have available in the home. Rosalie, (NL1g7), for instance, wanted to use the chat function of the game Star Stable because her friend used it. Also, some children mentioned having a friend with a Facebook account, something they did not have themselves and were able to check out regardless of whether their parents liked it (see section 3.1.3). In one family (i.e., the family Bergmans, NL2), the parents actively reduced the influence of friends by not allowing the children to use devices with their friends. Once, a friend brought his own tablet, but dad forbade the children to use it: *"I found that unhealthy,"* as he put it. (NL2f59) This rule applied to the family's own house as well as friends' houses: when Simon (NL2b7) went to a friend and his friend wanted to play on a tablet or a game computer, Simon was to leave and go home.

3.2 How are new technologies perceived by the different family members?

In the interviews we asked children to arrange cards representing a range of activities, toys and devices according to those they found not so much fun (sad smiley), fun (happy smiley) and very fun (very happy smiley). We asked parents to do the same, namely to arrange the cards according to those they believed the child would find not so much fun, fun or very fun. More information regarding methodology is provided in section 4. The cards children and

parents chose most often as very fun are depicted in Figure 3.4. In the annexes (see section 7.1) the exact number of parents and children who chose a particular activity, toy or device are provided for all of the cards, including the two other categories of “fun” and “not so fun”.

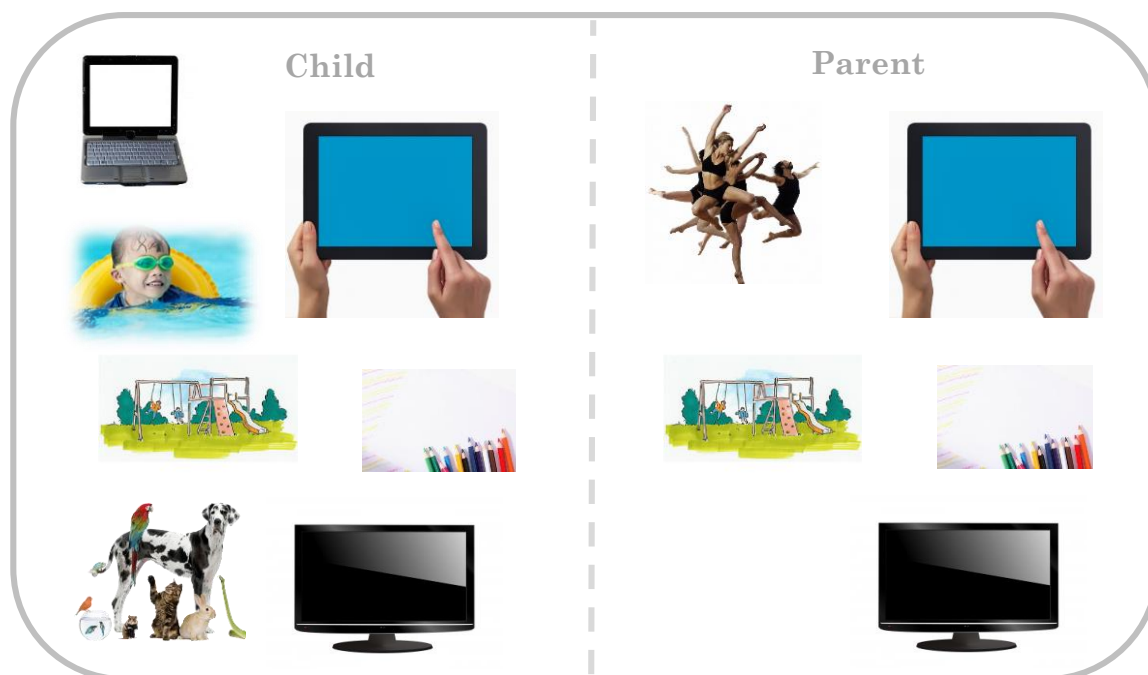


Figure 3.4 Most fun for the child according to the child (left) and the parent(s) (right)

Figure 3.4 shows that children are generally positive about the tablet, the laptop and the television. The parents' responses confirmed that using the tablet and television are among the most popular activities for children to engage in, although they slightly underestimated the popularity of the laptop. Several children also indicated to find the smartphone, iWatch, MP3 player, toy tablet and game consoles to be very fun. Yet the number of children who chose these devices was smaller, reflecting that differences between children existed in their affinities for technologies (see sections 3.1.1 and 3.1.4). As indicated previously, these preferences depend on a range of circumstances, such as availability of devices, the availability of alternative options for spending leisure time, the kinds of apps installed and the kinds of interests children have. Another important finding illustrated by Figure 3.4 is that young children's preference for new technology is generally balanced out by their preference for non-media play. Most children indicated to find swimming, outdoor play, drawing and animals (e.g., petting them) very fun and the parents' responses confirm this, although the parents overestimated the extent to which their children enjoyed dancing.

The activities, toys and devices children did not find (very) fun were not the primary focus of the interviews, so we know less about why children did not enjoy these (so much). Interestingly, some children did mention negative aspects of the technologies they enjoyed. Sophie (NL5g7), indicated she engaged in a large variety of activities (gymnastics, playing with friends, playing board games, playing with LEGO, listening and dancing to music) and used the tablet moderately: *“Because too much is not good. You have to do something with your legs because, well, or else you will become a bit fat.”* (NL5g7) And Sven (NL10b11) and Matthijs (NL10b7a) explained they were concerned about Kars (NL10b7b) spending too much time playing on the Wii, as they thought it was bad for his eyes.

Parents vary in their support of children's digital media use. Some can be labelled as advocates or, at least, positive suppliers: they provide a rich home media environment, offering their children ample opportunity to explore digital devices (see section 3.3 for more information regarding parental mediation). One example is Cynthia (NL7m28). Although she did not really use new technologies besides her smartphone, she was generally positive about Haylee's (NL7g7) use of them: *"That is just 2015. This is the world. We are about to go only digital. (...) It should not be an issue. (...) It should not be a problem that children are on them."* Other parents are (explicitly) negative and limit their children's media use accordingly. The best example is Fatma (NL9m39), who was extremely negative and thought digital media were unhealthy, boring, a waste of time, and felt they "brainwash" children. Then there were parents who can be qualified as "in-betweens": they allow the use of digital media, acknowledge positive and negative aspects, and encourage non-media play. An example is Petra (NL5m47) who thought digital media were convenient, useful and even necessary but, more so than dad (John, NL5f47), was inclined to encourage Sophie (NL5g7) to stop watching television and read a book instead, or to play "real" board games with Sophie rather than the virtual versions.



Figure 3.5 Word parents associated with child's use of new technologies

Notwithstanding, most parents mentioned both "the bright and the dark side" of digital media. We asked parents to select from a pile of cards with words on them those cards they themselves associated with the target child's use of new technologies. In Figure 3.5 a word cloud is depicted of the words they selected, the larger words representing the words mentioned in more families. In the annexes an overview can be found for all cards and with the exact number of families in which each word was selected (see section 7.2). The one word most frequently chosen by parents was "educational", which was often accompanied by words such as "necessary competences", "curious", "informative" and "challenging". Also frequently chosen were the words "fun", "relaxing" and "easy/convenient". The most obviously negative word selected was "addictive". In Figure 3.6 a picture is shown of a selection made by the parents in

NL1, who chose all of the words mentioned above. As a negative qualification, “addictive” was closely followed by “distractive”, which was also mentioned by several parents.

The qualification that digital media are educational (and necessary, et cetera) is related to the sense generally shared by parents that children benefit from digital media by acquiring skills and knowledge required for school and in their later lives (also see section 3.1.3). Philip (NL8f45), for instance, explained how Felicia’s (NL8g7) use of digital media required her to think about how to spell words in Dutch or in English: *“One day she wanted to find her favorite song. Space, it is called. Well, then she really had to think about how to write Space. And is it English or Dutch? And how do you write it? It has helped her with her linguistic development.”* (NL8f45) And in another interesting anecdote Cynthia (NL7m28) recounted the time Haylee (NL7g7) found a clip on YouTube about the color of feces and told her mum all about it. However, some parents also indicated that occasionally a fine line separated “challenging” from “easy” and “too challenging”. Philip (NL8f45), for instance, added to his observation that applications such as Ambrasoft can be educational: *“She [Felicia, NL8g7] thinks it is fun for a little while and then she will think it is too difficult. And she sees – and this is a problem – all digital media primarily as fun. If it isn’t fun, she wants to quit.”* (NL8f45)



Figure 3.6 Word cars selected by parents in NL1

The latter quote also shows that there may be a fine line between positive and negative aspects of new technologies, not only for children (which is the case in the quote) but for parents as well. In all but one family at least one of the words “addictive”, “distractive” or “tension” was chosen by parents in addition to labels like “educational” and “fun”. Josephita (NL4m35) and Cynthia (NL7m27), for example, were generally positive about new technologies, yet they mentioned that digital media could be distractive and, consequently, isolating. Cynthia explained: *“Look, she [Haylee, NL7g7] is also rather social by telling things afterwards, but in the moment itself she is watching things really completely in her own world. If you ask her something, you won’t get a response because she is so caught up in that story.”* (NL7m27) Philip (NL8f45) added to this the remark that whether or not digital media were experienced by him and his wife as distractive in a negative sense depended on the social circumstances. For example, when visiting a restaurant they used digital media as a babysitter, thereby providing a convenient distractor to their children allowing a quiet dinner. However, when watching television or playing with her smartphone Felicia (NL8g7) tended not to see or hear her parents, a manner of distraction Philip (like several other parents) found annoying.

Finally, it is interesting to note that a slight majority of the parents mentioned that digital devices stir the children’s imagination. For example, Felicia (NL8g7) sometimes involved the smartphone in the (role)play she and her friends engaged in (see section 3.1.4). They would enact a play or dance and make a movie clip of this. Her dad furthermore noted that she had started to re-enact YouTube clips and felt she benefitted from that: *“It might seem as though*

you are watching something that is prefabricated, something you do not use a lot of imagination with. But you notice, for instance, that when she watches YouTube clips: <<Oh, that is fun, we are going to re-enact that now>>. So the imagination is also stimulated by certain things." (NL8f45) Other parents noted that stimulating the imagination could also be a negative thing. Daphne (NL6m37), for instance, explained that her daughters were not allowed to go on YouTube or Facebook without permission because otherwise they might see things that scare them. This was especially true for Naomi (NL6g7), according to mum: *"Naomi has a vivid imagination, so all the images she sees have a strong impact on her."* (NL6m37) In the family Mulder (NL5) this was the case for Sophie (NL5g7) as well, although for her television was the medium that was responsible for exposing her to upsetting information and images. Dad recounted the moment the photograph was shown in the children's news of the deceased Syrian boy, a refugee, lying face down in the sand of a Turkish beach. In this particular case he felt it was a good thing children were made aware of grave incidents happening in the world. However, some digital content is clearly not age-appropriate according to parents. Cynthia explained this very elegantly: *"Just type in <<pussy>> on YouTube. Then you get all sorts of strange clips."* (NL7m28)

3.3 How do parents manage their younger children's use of new technologies?

When summarizing the perspectives of the parents on their way of mediating children's media use, three types of what we call "mediation styles" can be tentatively distinguished. These three types show an obvious correspondence with the variety in attitudes described in section 3.2. Some elements of the mediation styles can be mutually compatible, for example when a parent who is inclined to give a child a lot of space stimulates outdoor play. Therefore they should be seen as the emphasis parents tend to place on particular values, for instance freedom, balance or protection. The three mediation styles can be labelled as follows:

- **"Freedom within boundaries"**: these are parents who allow their children much room for exploring digital media. Although all these parents have certain (implicit) rules, they provide many opportunities for access to devices, give much leeway in the sense that they are lenient with respect to time spent on media use, and in some cases even explicitly encourage children's use of digital devices. For example, in NL7, mum stimulated Haylee's use of digital technology in general and educational apps in particular, because she wanted her daughter to be prepared for a digital future.
- **"Striving for balance"**: these are parents who are not necessarily very strict with their children's media use, but at the same time try to prevent digital devices from playing too big a role in their children's lives, both by encouraging them to undertake other activities and by employing rules that restrict media use to some degree. For example, Piet (NL1f56) and Annejet (NL1m41) felt it was important to spend as much time as they could with their children and did not place a lot of emphasis on digital activities, as other things (e.g., "real" things and consequences) were important as well.
- **"Maximizing limits"**: these are parents who aim to protect their children against negative effects of digital media, for instance social isolation, and take measures to explicitly limit their children's media use. These measures involve some rules that are quite strict, for instance Fatma (NL9m39) hiding her smartphone for her daughter Esra (NL9g7), and Bart (NL2f59) and Annemarie (NL2m44) requiring Simon (NL2b7) to leave a friend's house whenever a digital device appears.

Measures parents adopt to limit their children's media use take various forms. They involve physical limitations, such as putting a children's lock on the smart TV, using password

protection on the computer, removing certain television channels, making use of the YouTube option to show only age-appropriate clips, buying a tablet computer with limited functions, or, in the case discussed previously, even hiding devices. For example, in the family Bergmans (NL2) Bart (NL2f59) and Annemarie (NL2m44) indicated they purposefully did not buy a new tablet after the old one had broken down. This was also one of the tips Fatma (NL9m39), who held very negative views about digital media, provided when asked which advice she would give to other parents regarding their children's use of new technologies: do not buy (too many) of them. Her own daughter Esra (NL9g7) owned a tablet, though, because her dad—the parents were divorced—had bought it for her.

Measures also take the form of explicit rules. Parents mentioned various rules that apply to four different domains. First, some apply to the acquisition and use of specific content. This means that children are not allowed to download their own apps, watch particular television programmes, or play particular games. Age-appropriateness was regularly mentioned as a criterion for content selectiveness. Second, several rules apply to timing, examples of which are: no television watching on weekday mornings, no media use during mealtimes, and rules with respect to the maximum time children are allowed to use a device. Some rules specifically concern the combination of content and timing, for instance: no energizing media activities before bed. Third, location or context form the basis of some rules. For example, Simone (NL10m36), who was very lenient towards her children's media use, did not allow her sons to take devices outside. In other cases, children were not allowed to use digital devices when playing with friends. Patrick (NL3f46) and Willemijn (NL3m35), for instance, forbade their daughters to use their tablet or watch television during play dates. Fourth, rules often revolve around control. This implies, for instance, that children have to ask for permission to use devices such as smartphones or to use certain (social) media such as Facebook, WhatsApp or YouTube. In some cases, children can only use these media with the parents present or they can only connect with people known to parents.

Another way of limiting children's media use that was mentioned by parents, is by offering, stimulating or enforcing alternative activities. Cynthia (NL7m28), for instance, hardly restricted her daughter Haylee's (NL7g7) use of digital media. However, Haylee tended to watch a lot of television and in such cases Cynthia turned the device off and asked her to do something else, for instance play outside. When parents were asked whether they could write down tips they would give other parents concerning their children's use of new technologies, several referred to the stimulation of other (non-media) activities:

"Don't let it replace the <<normal>> play, but let it be an addition." (Bart, NL2f59)

"Let technologies be a small part of the life/development of the child. Being bored should also be a part of the life of the child and handicrafts should also receive more time." (Annemarie, NL2m44)

"Can contribute to development, but limit it as well. Also very important to engage in <<real>> play because of the development in other areas." (Arjen, NL6f39, and Daphne, NL6m37)

Furthermore, some parents monitor their children's use rather than set very strict rules. Philip (NL8f45), for example, felt no explicit rules were required for his daughter Felicia (NL8g7) yet, but suspected that this would change when Felicia grew older and he was no longer able to sufficiently monitor her use of new technologies. His mediation style of "freedom within boundaries" formed a stark contrast to the "striving for balance" style employed by John (NL5f47), who believed young children's digital media use requires stronger parental control so that they grow in their use of them and gradually gain skill and freedom. He made a direct

comparison to the typically Dutch activity of learning how to ride a bike: *“You start practicing in the backyard with the bike and gradually you move towards the street.”* (NL5m47). Monitoring sometimes results in on-the-spot decisions, such as parents *ad hoc* telling their children to stop when they feel they have spent too much time using a device, without having agreed on a maximum time beforehand.

Finally, several other noteworthy findings emerged from the interviews with respect to the way parents managed their children’s use of new technologies. First, sometimes there are differences in leniency between parents. Yet there are no obvious tendencies: sometimes dad is less strict and sometimes mum. Second, most parents do not seem concerned about privacy issues. In a majority of the interviews privacy was notably absent as a topic of conversation. There were a few exceptions. Piet (NL1f56) objected to his daughter being filmed because he was concerned about her image being recorded in general. Furthermore, John (NL5f47) was the only parent who mentioned screening apps for the type of data they collected. And third, although most parents considered digital media educational, necessary and fun (see section 3.2), they hardly talked about consciously stimulating their children to use new technologies. Instead, they were more likely to talk about giving space (in particular those who adopted a “freedom within boundaries” mediation style), about stimulating alternative activities (especially those who adopted a “striving for balance” mediation style), or about restricting usage (particularly the parents who adopted a “maximizing limits” mediation style).

4. Method

4.1 Procedure

In the summer of 2015, ten schools visited by children with a variety of backgrounds were asked to distribute (paper and/or online) questionnaires among parents of 2080 young children about their children's out-of-school media environment. The schools were concentrated in the Amsterdam and Rotterdam regions of The Netherlands. One aim of the questionnaire was to select families for the present study. Therefore, parents were asked in the questionnaire to indicate whether they would be willing to participate in a follow-up interview, for which they would be compensated with a 25 euro gift card and a goodie bag for the children. In the questionnaire they also provided information that was relevant to our selection procedure, namely how many children they had, the ages of their children, whether they were single parents or had a partner, the highest level of education they (and they partner) had obtained, and their (and their partner's) country of birth. Parents of 600 out of 2080 children filled in the questionnaire and approximately 50% of those parents indicated to be willing to participate.

After the questionnaires were distributed, a selection of families of interest was made among the parents who had indicated in the questionnaire to be willing to participate (see section 4.3 for the selection criteria). A research assistant then contacted these families by telephone, who gave more information regarding the interview and, if possible, made an appointment. Parents were contacted until ten families had agreed to participate; six families did not want to participate after receiving information about the interview.

In September and October of 2015, the ten interviews were conducted by one experienced researcher (the first author) and four trained research assistants at the families' homes. Each family was visited once by two interviewers simultaneously so that one interviewer could focus on the parent(s) and one on the child(ren). The interviews were voice recorded and videotaped, with the exception of one family (i.e., NL1). In that case the interview was only voice recorded, as dad did not feel comfortable with his daughter being filmed. Furthermore, photographs were made during each of the activities in the interview (see section 4.4) while ensuring the anonymity of the family members.

4.2 Ethical considerations

Prior to the data collection, approval for the research was obtained from the Scientific and Ethical Review Board of the Faculty of Behavioural and Movement Sciences and Education at the Vrije Universiteit Amsterdam. Furthermore, prior to each interview a consent form provided by the JRC, and translated in Dutch by the first author, was sent to parents for review. At the start of the interview, the visiting researchers discussed the main points in the consent form with the parents as well as the children, answered questions and asked parents to sign the form. The researchers stressed that participation was voluntary and that at each point, the parents as well as the children could terminate the interview. Finally, the names used in this report are fictitious.

4.3 Sample

An overview of the sample characteristics is provided in Table 4.1. The main goal of the sampling procedure was, in accordance with the criteria provided by the JRC, to select a diverse sample of ten families with one child aged six or seven and at least one younger sibling.

The children aged six or seven were the “target children” and they typically attended grade 2. In The Netherlands, most children start going to pre-school when they are four years old and attend it for two consecutive years. They start learning to read and write in grade 1, the first year after pre-school, when they are approximately six years old. All children in our sample had received at least one year of formal education in reading and writing.

Table 4.1 Characteristics of the sample

Family code	Member code	Ethnicity		Sex	Age	Years of school / level of education obtained		Profession parents
NL1	NL1f42	Dutch	(*)	m	56	Secondary (senior general secondary education)	(*)	unemployed
NL1	NL1m38	Dutch	(*)	f	41	Secondary (senior general secondary education)	(*)	administrative assistant
NL1	NL1g7	Dutch	(*)	f	7	3 rd Primary	(*)	
NL1	NL1b3	Dutch	(**)	m	5	1 st Primary	(*)	
NL2	NL2f58	Belgian	(*)	m	58	Tertiary (pre-university education)	(*)	secondary school teacher
NL2	NL2m43	Dutch	(*)	f	43	Tertiary (higher professional education)	(*)	self-employed in advertising
NL2	NL2b7	Dutch	(*)	m	7	2 nd Primary	(*)	
NL2	NL2b5	Dutch	(**)	m	5	Pre-school	(*)	
NL3	NL3f46	Dutch	(*)	m	46	Tertiary (university)	(*)	unemployed
NL3	NL3m35	Dutch	(*)	f	35	Tertiary (higher professional education)	(*)	account manager
NL3	NL3g7	Dutch	(*)	f	7	1 st Primary	(*)	
NL3	NL3g5	Dutch	(**)	f	5	1 st Primary	(*)	
NL4	NL4f42	Dutch	(*)	m	42	Secondary (senior general secondary education)	(*)	self-employed
NL4	NL4m35	Dutch Antillean	(*)	f	35	Secondary (higher professional education)	(*)	counselor and coach
NL4	NL4g6	Dutch	(*)	f	6	2 nd Primary	(*)	
NL4	NL4g4	Dutch	(**)	f	4	Pre-school	(*)	
NL5	NL5f47	Dutch	(*)	m	47	Tertiary (higher professional education)	(*)	employee technical university department
NL5	NL5m47	Dutch	(*)	f	47	Tertiary (university)	(*)	primary school teacher
NL5	NL5g7	Dutch	(*)	f	7	2 nd Primary	(*)	
NL6	NL6f39	Dutch	(*)	m	39	Tertiary (secondary vocational education)	(*)	unemployed
NL6	NL6m37	Dutch	(*)	f	37	Tertiary (secondary vocational education)	(*)	daycare worker
NL6	NL6g7	Dutch	(*)	f	7	2 nd Primary	(*)	
NL6	NL6g9	Dutch	(**)	f	9	4 th Primary	(**)	
NL7	NL7m28	Dutch	(*)	f	28	Tertiary (higher professional education)	(*)	operating assistant
NL7	NL7g7	Dutch	(*)	f	7	2 nd Primary	(*)	
NL8	NL8f45	Dutch	(*)	m	45	Tertiary (higher professional education)	(*)	employee bookstore
NL8	NL8m42	Singaporese	(*)	f	42	Secondary (senior general secondary education)	(*)	manager wholesale business
NL8	NL8g7	Dutch	(*)	f	7	2 nd Primary	(*)	
NL8	NL8g2	Dutch	(**)	f	2	Daycare	(**)	
NL9	NL9m39	Turkish	(*)	f	39	Tertiary (secondary vocational education)	(*)	employee municipality
NL9	NL9g7	Dutch	(*)	f	7	2 nd Primary	(*)	
NL10	NL10m36	Dutch	(*)	f	36	Secondary (prevocational secondary education: theory-oriented)	(*)	unemployed
NL10	NL10b11	Dutch	(*)	m	11	5 th Primary	(*)	
NL10	NL10b7a	Dutch	(*)	m	7	2 nd Primary	(*)	
NL10	NL10b7b	Dutch	(**)	m	7	2 nd Primary	(*)	

Note. (*) Data provided by the family; (**) researcher evaluation.

The JRC furthermore required that the sample comprised one only-child family, one single-parent family and one family with at least one older sibling. As can be seen from Table 4.1, our sample consisted of three only-child families (NL5, NL7 and NL9), three single-parent families (NL7, NL9 and NL10) and two families with one older sibling (NL6 and NL10).

Additionally, we wanted to select families from a diversity of socio-economic backgrounds, for which we used the highest educational level obtained by the parent(s) as an indicator. In three families, both parents or the single parent had obtained a lower educational level (NL1, NL6 and NL10); in three families, one parent had obtained a lower and one a higher educational level (NL4, NL8 and NL9); in four families, both parents or the single parent had obtained a higher educational level (NL2, NL3, NL5 and NL7).

We furthermore aimed to select some families with at least one parent whose country of birth was not The Netherlands. Because the selection criteria mentioned previously limited the number of families to choose from, we did not actively select parents with a diversity of ethnic backgrounds. Nonetheless, in four families one parent was born in a country different from The Netherlands (i.e., in Belgium, the Dutch Antilles, Singapore and Turkey).

4.4 Interview

In-depth interviews were conducted at the families' home. They generally lasted one-and-a-half hour and in no case exceeded two hours. The family visits were structured around the activities listed below. The activities were designed with the aim of encouraging family members to reflect on a range of topics without steering in a particular direction, for instance to avoid triggering parents to think about risks and rules rather than benefits and opportunities. Research assistants were trained to ask as much as possible open-ended questions, preferably the question "Could you tell me more about that?".

- **Introduction and briefing (5-10 min):** the interviewers introduced themselves, explained the aims of the research project and the structure of the interview to the entire family, checked whether it was possible to conduct the children's interview in a separate room and whether children were allowed to show how they used digital technologies, asked whether they could take pictures, and finally asked parents to sign the consent form.
- **Ice-breaker activity (20-30 min):** by using an activity book and stickers (Insafe, 2015), families were asked to explain what a typical weekday in their lives looked like. An example of the activity book filled with stickers by one of the target children is provided in the annexes, section 7.3.
- **Interview with parent(s) (45-60 min):** one interviewer sat down with one or two parents without the children and went through each of the activities below successively.
 - **Introductory questions:** the interviewer first invited parents to tell more about the target child, with a focus on what favourite activities in general and digital activities in particular were.

- **Card game:** the interviewer asked parents to sort 30 cards depicting a variety of activities, toys and devices into three piles: those they thought the target child would find very fun (very happy smiley), fun (happy smiley) and not so fun (sad smiley). An example of a card game finished by parents is provided in the annexes, section 7.4. Two or three of the most fun devices were then selected by the interviewer to follow-up with questions regarding the three main research questions, i.e., how family members (especially the target child) used the devices, what the perception of family members (especially the parents) towards the use of these devices were, and how parents managed their children's use of these devices.
- **Words cards:** the interviewer invited parents to select from a set of 30 cards with words on them, the words they associated with the target child's use of new technologies. These cards were then clustered by the interviewer together with the parents and the interviewer asked them to tell more about each cluster. An example of words cards chosen by parents from one family is provided in section 3.2, Figure 3.6. The entire list of words is given in the annexes, section 7.2.
- **Tips:** the interviewer asked parents to write down on a blanc page tips they might have for other parents concerning their children's use of new technologies. Next, the interviewer invited parents to tell more about the tips.
- **Media history:** the interviewer asked parents to fill out a form and check the boxes of the devices that were present in the home, used by the target child, and owed by the target child. In section 3.1.1., Figure 3.1, a list is provided of the devices incorporated in the form. Next, the interviewer invited parents to reflect about how many hours a week the target child currently used the device, when the child had started to use the device, how many hours a week the target child used the device then, how usage had developed, and which contextual factors had influenced usage. A graph was made by the interviewer on a blanc page to aid this reflection process. In case the target child had siblings, the interviewer went through these steps for them as well.
- **Interview with child(ren) (45-60 min):** parallel to the interview with the parent(s), the second interviewer sat down with the target child (and siblings) and went through each of the activities below successively.
 - **Introductory questions:** in case of families with two children or more, the interviewer first asked the children to decide on some ground rules (e.g., "when one person speaks the others listen"). Next, the interviewer invited children to tell more about their favourite activities in general and digital activities in particular.
 - **Card game:** the interviewer invited each child to sort 30 cards depicting a variety of activities, toys and devices into three piles: those they found very fun (very happy smiley), fun (happy smiley) and not so fun (sad smiley). See previously. An example of a card game finished by a child is provided in the annexes, section 7.4.

- **Observation:** after finishing the card game, the interviewer asked the children to show how they used digital devices with the main goal of assessing their digital skills. Most children chose to demonstrate how they used the tablet. While using the device, the interviewer asked questions related to their digital skills (e.g., “Can you tell me which devices you can use on your own?”).
- **Closing (5-10 min):** the interviewer thanked the entire family for participating, asked whether they had anything to add to what had been said previously, answered questions, and handed over a 25 euro gift card to the parents and the goodie bag to the children.
- **Field notes:** each interviewer went home and wrote down field notes. In the field notes, the interviewer addressed: which neighbourhood the house was located in, which media were visible in the home, how the family dynamics were (e.g., how siblings were with each other), how the target child used new technologies, which contextual factors influenced usage (e.g., interests, peers, school), which perceptions the target child and family members had of new technologies, how parents managed their children’s use of new technologies and whether there were other notable observations.

4.5 Analysis

First, each interview was coded by watching and listening to the recordings and reading the field notes. The aim of this first step was to cluster and write down the core information relevant to answering the three research questions in a coding template. The template is provided in the annexes, section 7.5. The authors of this report and two of the research assistants were responsible for coding the interviews. Throughout the coding process, the first author discussed with the interviewers that had been onsite whether the picture that emerged of each family was in accordance with their impressions.

Next, the family portraits (see section 2) were made by the two authors, which consisted of a description of the following elements: relevant background information regarding the family, the devices available to the target child at home, the way the target child (and siblings) used new technologies, the way parents used and perceived new technologies that were used by the child, and finally the manner in which they managed their children’s usage.

As a final step, the findings (see section 3) were obtained by the authors, who went through each family portrait and looked for patterns and themes in relation to the research questions. Deviations of the patterns were also taken into account.

4.6 Limitations and recommendations

The collection and analysis of the data generally proceeded satisfactorily and yielded valuable information, but there were some limitations with respect to the process as well. First, there might have been a selection bias in the sampling procedure. We made a great effort to select families with a diversity of backgrounds, for instance by distributing the questionnaire in a variety of schools, eliciting the help of those schools, offering parents assistance for filling out the questionnaire, making several translations of questionnaires, and offering parents to conduct the interview at their children’s school instead of their homes. Consequently, we succeeded in interviewing a diverse sample of families. However, families were generally

welcoming and willing to open up their homes to strangers. It is unclear which kinds of stories we would have elicited from families who are less likely to participate in a time-consuming interview with strangers about their family life.

Second, the goal of each interview was to assess the perceptions of the different family members. Prior to the interview the assistant who contacted the family emphasized that the interview was to be conducted with all family members. Yet in some cases there was a reason that prevented one parent from participating in the interview (fully). For example, in NL1 mum had to leave early with the youngest child for swimming lessons, in NL4 dad was not present for unclear reason, and in NL8 mum did not speak Dutch because of which dad took charge of the interview. Also, younger siblings were often not capable of participating (fully). For instance, in NL1 the younger sibling was too shy to speak to the interviewers and in NL8 the sibling was too young to participate. Consequently, the family portraits and the findings do not necessarily reflect the perceptions of all family members.

Furthermore, some requirements made by JRC were not met. One goal of the interviews with parents was to assess how the usage of each device for each sibling had developed over time by means of the Media History instrument. However, parents generally found it difficult to estimate how many hours a week each child used each device in past and present. Therefore, the graphs resulting from this part of the interview were not included in the annexes, as was required by the JRC. Instead, the stories we elicited from the parents were incorporated in the family portraits when relevant.

Another requirement made by JRC was to indicate in the portraits of the family members whether they were either infrequent, moderate or frequent users of new technologies. We did not incorporate these labels as we did not have criteria for deciding in which category each family member fell. For example, the mum in NL7 was a keen user of the smartphone but did not really use other digital media, which made it difficult to decide which label was applicable to her. So instead, we provided qualitative information in the family portraits regarding the media habits of each family member.

JRC also required an assessment of the skills of the target children by means of an instrument under development derived from the DIGCOMP framework (Ferrari, 2013). However, our protocol for observing children's skills proved insufficient for deriving relevant information and to do so in a consistent manner. For instance, in several families the battery of the tablet was not charged or a device did not work, because of which no observation took place. And when children did demonstrate their usage of a device, the child was typically too distracted to answer questions and the types of activities demonstrated were too limited to demonstrate a range of skills. Therefore, no information regarding children's skills is incorporated in this report.

Finally, JRC asked researchers from participating countries to provide information regarding family income in the sample characteristics (see Table 4.1). In The Netherlands this is a culturally sensitive topic to inquire about, so we did not gather such information. Instead, we asked parents to indicate in the questionnaire the highest educational level they had obtained, which is a common measure in The Netherlands for assessing socio-economic status and is known to be highly correlated to income.

Taking these limitations into account, we recommend that in future research some elements of the protocol are modified so that more reliable information can be gathered with respect to the development of children's use of technologies, the frequency of usage, and young children's skills. With respect to the perspectives missing of some families or family members we see no obvious solution. We made a great effort to approach a variety of families and to accommodate

their wishes, something we recommend is also done in future research. Administering a questionnaire proved especially useful for finding families with diverse backgrounds. Adopting a mixed-methods approach (i.e., administering a questionnaire in a larger sample and conducting interviews in a smaller sample) might also be a fruitful approach in future studies for another reason, as it allows the generalization of findings to a greater extent and at the same time yields in-depth information.

5. Conclusion

The present study was conducted as part of a larger European study coordinated and funded by the European Commission's Joint Research Centre to fill the gap in knowledge of the ways children under eight engage with new technologies and the risks and benefits associated. This national report presented the findings from the in-depth, qualitative interviews that were conducted in The Netherlands among ten families with children aged six or seven (labelled the "target child"), their siblings and their parents. The study was guided by the following overarching research questions:

- RQ 1: How do children under the age of eight engage with new technologies?
- RQ 2: How are new technologies perceived by the different family members?
- RQ 3: How do parents manage their younger children's use of new technologies? Are their strategies more constructive or restrictive?

Below the key findings are summarized and recommendations are provided to policy-makers, industries, parents and carers, and educators.

5.1 Key findings

One important factor influencing whether and how children use new technologies is their access to them at home. The television (either digital or analogue) was the device most frequently used across families, followed by the digital television and the tablet. In a slight majority of the families that were interviewed none of the digital devices were in the target children's possession. Instead, they were either considered "family devices" or the devices were in the parents' possession and children were allowed to use them. In four families the target child did own a mobile device. The largest discrepancy that was observed between media usage and ownership existed for the television, followed by the tablet. Furthermore, a range of circumstances either enabled or limited children's engagement with the technologies present: whether or not the parents considered a device a "family device", the availability of preferred activities and devices, the amount of leisure time available, and the ways parents managed their children's use of technologies

New technologies such as tablets, smartphones and, to a lesser extent laptops and personal computers, seem to fulfill many purposes. Children and parents used them for gaming, connecting with friends and relatives, watching videos and music clips, engaging in school- or work-related activities and searching for information. The children that were interviewed differed in the range of possibilities they used. This variability was observed between families, but also between siblings within families, and depended to a great extent on children's interests and practices adopted in the family.

Several target children use a digital device to follow-up on a particular interest or as an extension to regular play. A special case of interest-driven media engagement was that children's digital media use was sometimes influenced by family practices, i.e., the interests different family members held and the activities they preferred to engage in. Furthermore, in some cases, children incorporated new technologies in their regular play, for example by making video clips of their own songs and putting them on YouTube.

There are factors outside of the immediate family environment that influence children's engagement with new technologies. The single most influential one mentioned was school. In one family the children attended a so-called "iPad school", where most learning

activities are provided by means of tablets. In most schools, however, digital technologies did not dominate classroom practice and were used as a complement to learning through print materials. In these schools personal computers instead of tablets were available to children; in some families the parents indicated children were allowed to bring their own device to school at fixed times of the week. In case schools employed digital devices as a supplement to print materials, children were familiar with educational platforms such as Ambrasoft and several parents provided them with the opportunity to practice at home as well. Other factors outside of the family that influenced children's digital media use were very varied. In some families the extended family, especially grandparents, played a role. Peers, too, influenced what children did with technologies. In this manner, children were sometimes exposed to apps or devices they did not have available in the home, for instance Facebook.

Using the tablet and television are among the most popular activities for children to engage in. Several children also indicated to find the smartphone, iWatch, MP3 player, toy tablet and game consoles very fun. Yet the number of children who chose these devices was smaller, reflecting that differences between children existed in their affinities for technologies. An important finding was that young children's preference for new technology was generally balanced out by their preference for non-media play such as swimming, drawing and outdoor play.

Parents vary in their support of children's digital media use. Some can be labelled as advocates or, at least, positive suppliers: they provided a rich home media environment, offering their children ample opportunity to explore digital devices. Other parents were (explicitly) negative and limited their children's media use accordingly. Then there were parents who can be qualified as "in-betweens": they allowed the use of digital media, acknowledged positive and negative aspects, and encouraged non-media play. Notwithstanding, most parents mentioned both "the bright and the dark side" of digital media.

The word most frequently associated by parents with new technologies is "educational". This qualification was often accompanied by words such as "necessary competences", "curious", "informative" and "challenging" and was related to the sense generally shared by parents that children benefitted from digital media by acquiring skills and knowledge required for school and in their later lives. Furthermore, a slight majority of the parents mentioned that digital devices stirred the children's imagination. Yet some other parents mentioned that this could be a negative thing, for example because some images are too worrying for young children.

There may be a fine line between positive and negative aspects of new technologies. In all but one family at least one of the words "addictive", "distractive" or "tension" was chosen by parents in addition to labels like "educational" and "fun". One parent provided an explanation for this: whether or not digital media were experienced by him and his wife as a negative influence depended on the social circumstances. For example, when visiting a restaurant they sometimes facilitated isolation by providing digital media as a babysitter, but they found it annoying when their daughter was absorbed by a digital device and tended not to see or hear her parents.

Three types of what we call "mediation styles" can be tentatively distinguished. These should be seen as the emphasis parents tend to place on particular values, for instance freedom, balance or protection. "*Freedom within boundaries*": these were parents who allowed their children much room for exploring digital media. Although all these parents had certain (implicit) rules, they provided many opportunities for access to devices, gave much leeway in the sense that they were lenient with respect to time spent on media use, and in some cases even explicitly encouraged children's use of digital devices. "*Striving for balance*": these were

parents who were not necessarily very strict with their children's media use, but at the same time tried to prevent digital devices from playing too big a role in their children's lives, both by encouraging them to undertake other activities and by employing rules that restricted media use to some degree. "*Maximizing limits*": these were parents who aimed to protect their children against negative effects of digital media, for instance social isolation, and took measures (some quite strict) to explicitly limit their children's media use.

Measures parents adopt to limit their children's media use take various forms. These measures involved physical limitations (e.g., using password protection), stimulating or enforcing alternative activities (e.g., outdoor play) and explicit rules. Parents mentioned various rules that applied to four different domains: the acquisition and use of specific content (e.g., not being allowed to download apps); timing (e.g., no television on weekday mornings); the combination of content and timing (e.g., no energizing media activities before bedtime); location or context (e.g., no media during play dates); control (e.g., having to ask permission to use a device).

Some parents monitor their children's media use rather than set very strict rules. This sometimes resulted in on-the-spot decisions, such as parents *ad hoc* telling their children to stop when they felt they had spent too much time using a device, without having agreed on a maximum time beforehand.

5.2 Challenges and recommendations

5.2.1 Recommendations to policy-makers

Our study shows that parents see both the upsides and the downsides of digital media. Regarding the former, parents stress the educational value of digital devices. The educational applications most frequently named, however, were those provided by schools (particularly, Ambrasoft) and parents mentioned only few others. Policy-makers could help parents in providing them with information on high-quality educational websites or apps (or by encouraging other actors to do so). A Dutch example of such an initiative is a recent brochure developed by two Dutch organizations, called *Kennisnet* ("Knowledge Net") and *Mijn Kind Online* ("My Kid Online"), listing and describing 104 educational apps and websites for children aged two to eight (Kennisnet & Mijn Kind Online, 2013).

Regarding the downsides of digital media, parents were, among other things, worried about their children's exposure to age-inappropriate content. In some cases, parents tried to prevent such exposure by means of rules (e.g., not allowing their children to download apps themselves), while in other cases, they used features of media for protective actions (e.g., the Staring family, NL7, who used the YouTube option for age-appropriate clips). However, not all parents were so pro-active, even in this selective sample, and it can be expected that not all of them have the means and knowledge for such preventive actions, even though they might have the same worries. Additionally, little mention was made about self-regulatory behaviour among children. Policy-makers could play a role here, for instance by providing guidelines for selecting appropriate content or by enabling children to do so, through stimulating media literacy education.

5.2.2 Recommendations to industries

Our study showed that parents seek a balance between media activities and regular, non-media play, because they want to prevent their children from being absorbed by the former. Mostly, this implies parental regulation. We have also seen an interesting interplay occurring between media and non-media play, where, for instance, the former positively impacts the latter (e.g., using YouTube clips as inspiration for pretend play) or both types of play are integrated (e.g., children making videos of their pretend play or songs). Industries could accommodate parents' preference for balance by searching for connections between media and non-media play. One example from this study is the connection between the LEGO Wii game and regular LEGO building and play (see NL2). If designed well, such computer games could inspire children's fantasy play, leading to a more natural balance between media and non-media play.

Parents value the educational possibilities of digital media, sometimes leading them to explicitly encourage children's use of educational apps. This has a downside as well: one parent (Simone, NL10m36) actually removed Scula, an educational app, from the family laptop, because she was opposed to the (perceived) objective of the app, namely to practice test skills. The challenge for app designers and publishers then is to develop content that is educationally sound, attractive as well as playful, in the sense that it does not require children to "play school". Additionally, some parents indicated that, occasionally, a fine line separates "challenging" from "easy" and "too challenging". In order to develop apps that benefit children's learning and are tailored to the skills levels and needs of individual children, industries are encouraged to seek co-operation with educational researchers. A Dutch example of such a co-operation is "Bereslim" ("Smart as a Bear"), a developer of digital picture books and educational games. This organization works together with researchers from the universities of Leiden and Groningen, who help in making their products adaptive to children's needs, using data collected through the applications.

As indicated before: although parents were worried about children's exposure to age-inappropriate content, only some were able to use features of media or devices to protect children from possibly harmful input. Such features are not yet widely available and, even when they are, many parents are likely unaware of their existence. Media suppliers could thus think further about creating options for parents to protect their children (e.g., by filtering age-appropriate content and protecting their privacy) as well as more actively highlight and inform parents about these possibilities.

5.2.3 Recommendations to parents and carers

With the exception of television watching only few parents seemed to actively engage in their children's media use. However, given the high prevalence of digital media in many households, parents are in a unique position to tutor their children's emergent media skills. This could involve supporting children's technical skills (e.g., knowing how to download apps), their knowledge (e.g., knowing the difference between websites and apps), their strategic behaviour (e.g., knowing how to efficiently and effectively search for information), as well as their self-regulatory behaviour (e.g., avoiding age-inappropriate content). The same holds for stimulating possibly beneficial media activities. While many parents set rules to limit (certain types of) usage, hardly any of the parents interviewed actively promoted the types of activities they would likely find useful (given the affordances they attributed to digital media).

Given the protective rules parents set regarding their children's media behaviour, it was interesting to note that most parents did not seem concerned about privacy issues. Even though many parents allowed their children to use freely downloadable apps, the implications of the use of such apps (e.g., big data gathering) were no topic for discussion. Parents are therefore encouraged to be more critical of the use of (free) apps.

5.2.4 Recommendations to educators

We found that children frequently connected their media activities with regular play. This involved children playing games that corresponded with toys they played with (e.g., LEGO) or with board games they enjoyed (e.g., Battleship), but also children using content they found through digital media to inspire their regular play. Sometimes digital activities and regular play were even integrated, such as when children made videos of their own re-enactments or songs. Educators could use such examples of children's own, intrinsically motivated media play to use in their own teaching, making connections between digital media and learning, for instance, by using digital content to inspire regular textbook learning, allowing or encouraging children to search for digital content that matches lesson contents, or by using digital devices to process subject matter.

As described earlier, we saw that parents were worried about age-inappropriate contents. Some parents tried to prevent their children from being exposed to such contents by means of rules or by using features of media or devices for protective actions. Little mention was made, however, of children's own, self-regulatory behaviour. Obviously, the school is one context where even young children can be taught skills and strategies for dealing with the challenges of digital media use.

We also saw that children have different affinities with new technologies (and thus, likely, different ability levels). Teachers should be aware of such differences, so that they are able to differentiate their support of children's media literacy development.

6. References

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7. Annexes

7.1 Most fun for child according to child and parent(s)

	Child			Parent(s)		
	<i>Very fun</i>	<i>Fun</i>	<i>Not fun</i>	<i>Very fun</i>	<i>Fun</i>	<i>Not fun</i>
Swimming	9	0	1	8	1	1
Laptop	8	1	1	6	3	1
Television	8	2	0	10	0	0
Tablet	8	2	0	9	1	0
Playground	8	2	0	9	0	0
Animals	8	1	0	8	0	0
Drawing	8	2	0	10	0	0
Smartphone	6	3	0	7	2	0
Bike	6	3	1	8	3	0
Board game	6	4	0	5	3	1
iWatch	6	0	2	1	0	0
MP3 player	5	2	2	3	0	0
Building blocks	5	1	3	3	4	2
Toy tablet	5	2	0	1	2	1
Dancing	5	2	1	9	0	0
Music	5	3	0	4	3	0
Radio	4	5	1	5	3	0
Playmobil	4	4	2	2	5	1
Wii	4	4	2	5	2	0
Nintendo DS	3	3	3	3	2	0
Books	3	7	0	7	3	0
Barbie	3	4	3	4	5	1
Playstation	2	2	3	2	2	0
Baby doll	2	4	5	3	5	2
Ball	2	5	4	4	4	3
Car	2	1	5	2	1	4
Tennis	2	2	5	2	4	2
Toy laptop	1	1	6	0	6	2
Magnetic drawing board	1	3	5	1	4	2
e-Reader	1	1	5	0	0	0
<i>Total</i>	<i>140</i>	<i>76</i>	<i>60</i>	<i>141</i>	<i>68</i>	<i>23</i>

7.2 Words parents associated with child's use of new technologies

English translation	Dutch	Number of times mentioned
Educational	Leerzaam	9
Fun	Leuk	8
Necessary competences	Noodzakelijke vaardigheden	8
Curious	Nieuwsgierig	8
Informative	Informatief	8
Relaxing	Ontspannend	7
Easy	Gemakkelijk	7
Challenging	Uitdagend	6
Addictive	Verslavend	6
Explore together	Samen verkennen	6
Fantasy	Fantasie	6
Distractive	Afleidend	5
Cosy	Gezellig	5
With mom	Met mama	5
Useful	Nuttig	5
Social	Sociaal	5
Interesting	Boeiend	5
Family activity	Gezinsactiviteit	4
With dad	Met papa	4
Isolated	Afgezonderd	3
Necessary	Noodzakelijk	3
Annoying	Irritant	3
Tension	Spanning	3
Babysitter	Babysitter	2
Arguments	Ruzie	2
Anti-social	Asociaal	2
Boring	Saaï	1
Redundant	Overbodig	1
Difficult	Moeilijk	0
Confusing	Verwarrend	0

7.3 Activity book example



7.4 Card game example

Target child:



Parents:



7.5 Coding template

IB = Icebreaker, INTp= interview parent, INTc = interview child(ren), REP = reported or observed by interviewer

Context	
Family situation:	
Interior of house:	
Neighborhood:	
Parental profession:	
Structural properties:	
Personality child:	
Hobbies/interests child:	
Parent-child interaction	
Sibling interaction:	
(Extended) family:	
School:	
Peers:	
Interesting findings	
Daily structure [IB]	
Morning (week day):	
School (week day):	
After school (week day):	
Sleep (week day):	
Weekends:	
Siblings:	
Activities (child's perception) [INTc]	
Not fun:	
Fun:	
Very fun:	
Media use child:	
Media use parents:	
Media use siblings:	
Joint activities:	
Activities (parental perception) [INTp]	
Not fun:	
Fun:	
Very fun:	
Media use child:	
Media use parents:	
Media use siblings:	
Joint activities:	
Knowledge/skills	
Parental perception:	
Perception child:	
Observation child:	
Parental perception child's digital media use	
Words cards:	

Elsewhere in interview:	
Rules / parental mediation [INTp]	
Parental perception:	
Child's perception:	
Tips for other parents [INTp]	
Dad:	
Mum:	
Media history [INTp]	